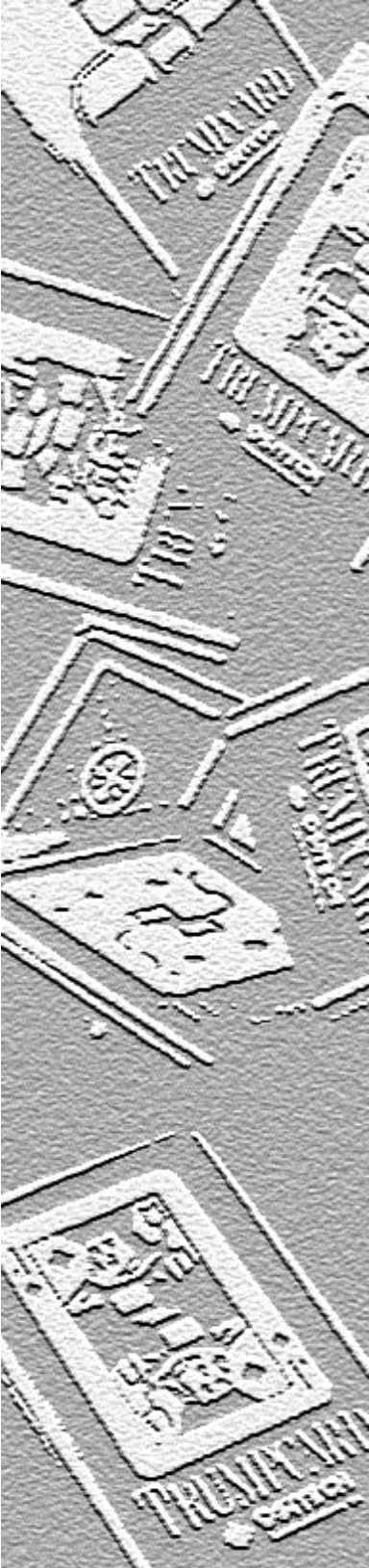


Five of Diamonds

33.6 Modem *with* DPI™ Digital Phone Interface

User's Guide



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How To Contact Us

At Ositech Communications Inc., we make every effort to provide our customers with products that fit their needs and work well. If you wish to communicate with technical support, sales or any other department at Ositech, please contact us in one or more of the following ways:

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Toll Free Telephone:	1-888-OSITECH (1-888-674-8324)
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Facsimile:	(519) 836-6156

24 HR Bulletin Board Service
(519) 836-1196
[8-N-1, up to 33.6 Kbps]

Internet:	World Wide Web	http://www.ositech.com
	FTP	ftp.ositech.com
	E-Mail	support@ositech.com sales@ositech.com

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, can cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the computer equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user be notified that any changes or modifications made to this device that are not expressly approved by Ositech Communications Inc. might void the user's authority to operate this equipment.

Operating Conditions

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device cannot cause harmful interference.
- This device must accept any interference received, including interference that might cause undesired operation.

Canadian Electromagnetic Compatibility Advisory

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Conseil sur la compatibilité des Electromagnétiques, pour le Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

U.S. Regulations Governing the Use of Modems

This equipment complies with Part 68 of the FCC rules. Located on the Modem is a label that contains the FCC Registration Number and Ringer Equivalent Number (REN) for this equipment. Upon request, you must provide this information to your telephone company.

The REN is useful to determine the quantity of devices you can connect to your telephone line and still have all of those devices ring when your telephone number is called. In most but not all areas the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you can connect to your telephone line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area. The REN for this device is 0.7B.

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But, if advance notice is not practical, you will be notified as soon as possible. You will also be informed of your right to file a complaint with the FCC.

Your telephone company might make changes to its facilities, equipment, operations or procedures which could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, contact your local telephone company for information on obtaining service or repairs. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment can not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Canadian Regulations Governing the Use of Modems

Note: *The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.*

Before installing the equipment, ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service can be extended by means of a certified connector assembly (telephone extension cord). Be aware that the above conditions do not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility, designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, can give the telecommunications company cause to request that the equipment be disconnected.


Make sure, for your own protection, that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution is particularly important in rural areas.

Caution: *Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician, as appropriate.*

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a terminal loop which is used by the device to prevent overloading. The termination on a loop can consist of any combination of devices, subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100. An alphabetic suffix is also specified in the Load Number for the appropriate ringing type (A or B), if applicable. For example, LN=20 A designates a Load Number of 20 and an "A" type ringer.

The Load Number for this device is 6.

For information on the location of the authorized Canadian maintenance facility nearest you, contact Ositech Communications Inc.

This product contains SPECTRUM CONNECTED  cellular data communication technology, which can be activated for data communication over a cellular network when a license is obtained from SPECTRUM, and the product is combined with an appropriate cellular telephone driver and corresponding cable compatible with popular brands of cellular telephones. To obtain a license and to determine the availability of an appropriate driver and cable for a cellular telephone, contact Ositech Communications, Inc.

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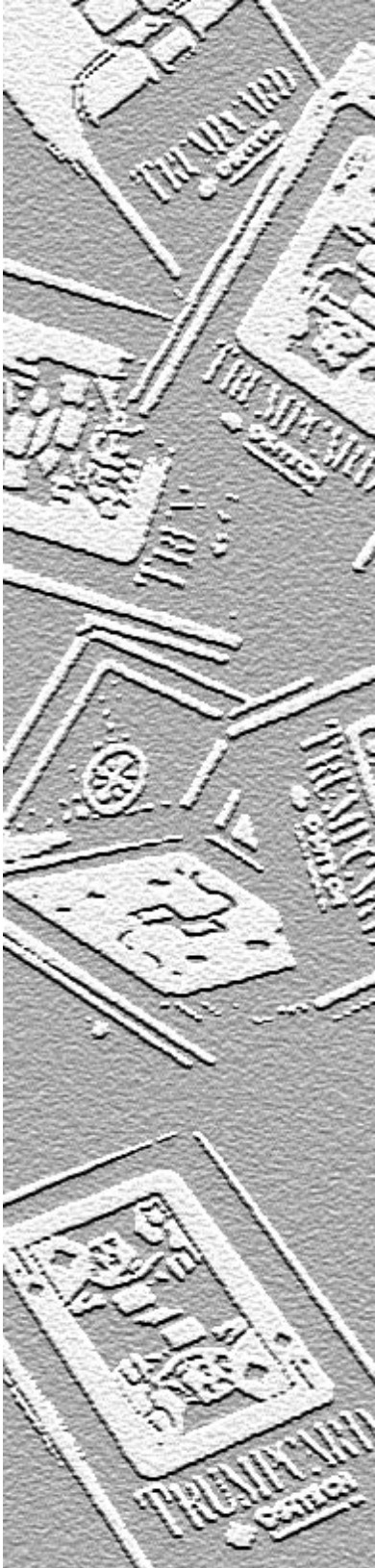
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Section One

Introduction



The Five of Diamonds is a 33.6 Kbps data and fax modem. The Five of Diamonds contains Ositech's Digital Phone Interface (DPI) technology.

The Five of Diamonds is a Plug and Play device. If your computer's operating system supports PC Card Plug and Play services, simply insert the Five of Diamonds into a PC Card Type II slot. Your computer and its operating system will automatically recognize and enable the Five of Diamonds as a modem and prompt you to insert the installation diskette in the 3.5" drive. After installing the Five of Diamonds and its software, the Five of Diamonds is ready for use. To use the advanced features of the DPI technology, run Ositech's setup program (refer to the section, "Configuring Your TRUMPCARD Modem for DPI Connections").

For operating systems that do not support PC Card Plug and Play services, Ositech provides enablers. Refer to the section "Installing the Software" for details.

With the Five of Diamonds installed, recognized and enabled, you can connect to any landline and perform data and fax operations.

To use the Five of Diamonds cellular model with a cellular phone, an optional cellular kit must be purchased.

Your Five of Diamonds is an analog modem which can connect, using Digital Phone Interface (DPI) Technology, to the digital (PBX) phones found in most businesses and hotels. Without access to a standard analog wall jack, the fully internal DPI is an economical way of connecting a TRUMPCARD modem to a digital (PBX) or key system.

The DPI is configured with factory default settings which have been successfully tested with many digital phone systems. In some circumstances, the DPI settings might

require adjustment to work with a particular digital phone system (refer to the section, “Configuring Your TRUMPCARD Modem for DPI Connections”).

About this Manual

This guide provides installation and operating instructions for the Five of Diamonds. The *Five of Diamonds User's Guide* is organized as follows:

- Section One, “Introduction” outlines the steps required to make the Five of Diamonds operational and describes its modem features.
- Section Two, “Installation” explains how to install the necessary hardware and software, and how to connect the Five of Diamonds to the telephone network.
- Section Three, “QuickStart Guide to Using Your Modem” is a abbreviated guide to performing basic modem operations with landline, cellular and DPI connections.
- Section Four, “Configuring Your TRUMPCARD Modem for DPI Connections” describes how to configure the modem settings to work with a DPI connection.
- Section Five, “Modem Command Reference” outlines the modem commands supported by the Five of Diamonds.
- Section Six, “Modem Test Procedures” describes tests which can be performed to identify and correct modem errors.

Throughout this manual, the term digital telephone system refers to any digital or digital-hybrid telephone system, such as PBX. Windows NT refers to versions 3.51 and 4.0.

Font conventions used in this guide:

- `Courier Regular` refers to any command which you enter using the keyboard.

For example, Type `ATDT`.

- **Courier Bold** illustrates onscreen messages or file names.

For example, The following message appears,
Connection Established!

Key Features of the Five of Diamonds

The Five of Diamonds is a 33.6 Kbps data and fax modem which contains Ositech's Digital Phone Interface technology.

The Five of Diamonds offers a number of unique features designed to integrate today's portable and laptop technology with users' needs:

- Built-in Digital Phone Interface (DPI) technology allows your Five of Diamonds to connect through digital (PBX) telephone systems.
- Power conservation modes (including sleep mode).
- Automatic wake-up on incoming call.
- 16550 Compatible COM Port.
- Flash ROM upgradeable.
- Automatic adaptation for landline, cellular or DPI operation.
- Windows-based DPI Wizard and DPI Assistant.
- Digital Line Guard.

Data Mode

The Five of Diamonds fully supports the following industry and ITU-T (formerly CCITT) standards:

- ITU-T: V.34 33.6+28.8, V.32 *bis*, V.32, V.22*bis*, V.22, V.23, V.21 and Bell 103/212A operation.
- Data rate adaptation to 230400, 115200, 57600, 38400, 33600, 28800, 26400, 24000, 21600, 19200, 14400, 12000, 9600, 7200, 4800, 2400, 1200 and 300 bps.
- Enhanced AT compatible command set.
- ITU-T V.42 LAPM error correction protocol.
- MNP 2, 3 and 4 error correction protocol.
- MNP 10 EC Error correction protocol for cellular communications.
- ITU-T V.42 *bis* data compression.
- MNP Class 5 data compression.
- V.42 and MNP negotiation.
- Automatic speed adjust.
- Full or half duplex transmission.
- Automatic dial, re-dial and answer.
- Pulse or tone dialing.
- Call progress detection.
- Line quality receive level monitoring.
- Diagnostics.
- Compatible with off-the-shelf communications/facsimile packages.
- Synchronous communications using Hayes AutoSync.

Fax Mode

The Five of Diamonds fax mode supports Class 1 and Class 2 AT fax commands for fax communications. To use the fax mode, you must use a fax communications software package. The Five of Diamonds supports the following fax standards:

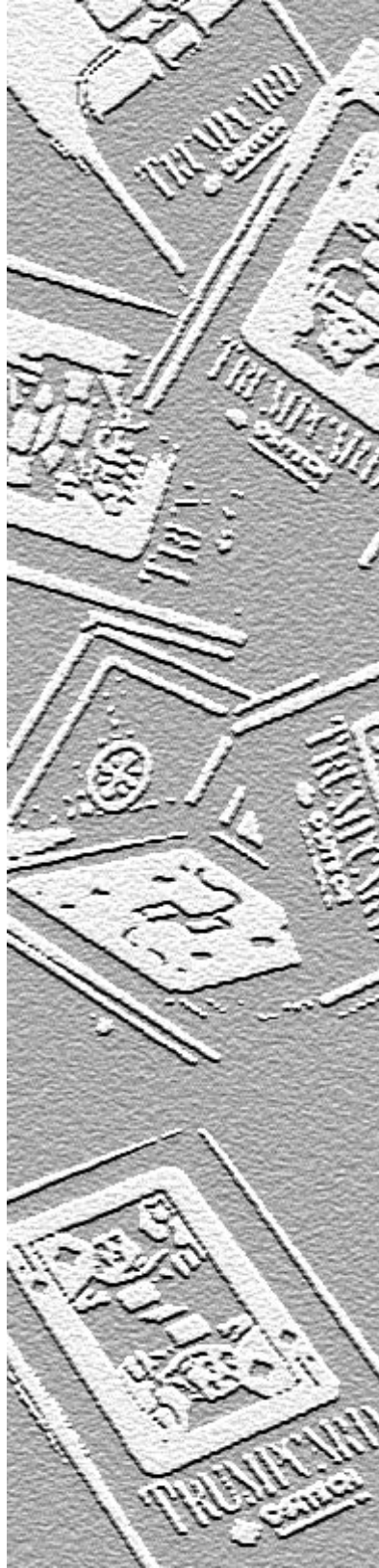
- Group 3 facsimile send/receive speeds of 14400, 9600, 7200, 4800 and 2400 bps.
- ITU-T V.17, V.29 and V.27ter.
- Facsimile Class 1 command set compatible.
- Facsimile Class 2 command set compatible.

Cellular Mode

The Five of Diamonds cellular model is compatible with an optional cellular kit that allows the Five of Diamonds to connect to a variety of cellular phones. For an up-to-date list of the cellular phones currently supported please contact Ositech.

Section Two

Installation



This section covers:

- Unpacking and inspecting the Five of Diamonds.
- Installing the hardware.
- Installing the software.
- Connecting the Five of Diamonds to the telephone network.

Unpacking and Inspecting the Five of Diamonds

Carefully inspect the contents of the box (listed below), to verify that everything you should have is included, and that nothing has been damaged during transportation. Retain the packing material in case the unit needs to be returned for service.

Package Contents

- The Five of Diamonds.
- The Direct-connect modem cable.
- The DPI adapter (black coupler).
- The automatic installation and configuration software diskette(s).
- The *Five of Diamonds User's Guide*.
- The Data+Fax software.

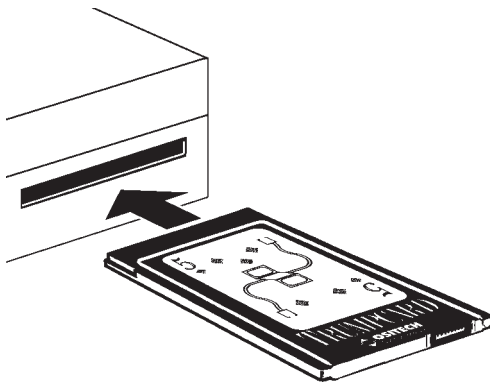
Installing the Hardware

The Five of Diamonds can be inserted into a computer whether the computer's power is ON or OFF. The following are general installation instructions that apply to most computers. Please refer to the documentation accompanying your computer for any additional instructions on installing PC Card adapters.

To install the Five of Diamonds:

- 1 Orient the Five of Diamonds so the 68-pin connector is next to the PC Card slot of your computer.
- 2 Insert the Five of Diamonds into the slot until it is firmly seated.

Note: The Five of Diamonds is keyed to go in one way only. If you feel resistance before the Five of Diamonds is fully inserted, remove it, align it as shown in the figure below and re-insert it.



Inserting the Five of Diamonds in your computer.

The Five of Diamonds is a Plug and Play device. If your computer's operating system supports PC Card Plug and Play services, simply insert the Five of Diamonds. Your computer's operating system will automatically recognize and enable the Five of Diamonds as a modem, and prompt you to insert the software installation disk in your computer. The software is automatically installed.

For Windows 95 and NT, a further step might be necessary to obtain an information file provided on the installation and configuration diskette. A setup program is provided for the Windows 95 and NT environments to determine what software is required to recognize and enable the Five of Diamonds as a modem. Refer to the next section "Installing the Software" for details.

Note: To use the advanced features of the DPI technology, run Ositech's setup program (refer to the section, "Configuring Your TRUMPCARD Modem for DPI Connections").

Installing the Software

If your computer's operating system provides support for PC Card Plug and Play devices, it will recognize automatically and enable the Five of Diamonds as a modem. If your computer's operating system does not provide support for Plug and Play devices, then an enabler (available on the installation diskette) is required. Ositech provides a Windows environment setup utility to aid any configuration process required to make the Five of Diamonds operational.

To install the software:

- 1 Insert the Installation and configuration diskette into the 3.5" floppy drive.
- 2 Invoke the file **Setup.exe**.
- 3 Follow the dialog instructions.

Windows 3.x

The setup utility and associated configuration utility determines if PC Card Plug and Play support exists. If it does not, an Ositech enabler is automatically installed.

Windows 95 & NT

The setup utility for these Windows environments installs any files required by your computer's operating system to properly recognize and enable the Five of Diamonds as a modem. The installed information files provide your computer's operating system with details about operating the Five of Diamonds' modem features and functions.

SCO Unix and Unixware

These operating systems do not provide PC Card Plug and Play support. Ositech provides an enabler for these operating systems. Refer to the documentation provided with the operating system software for more details.

Other Operating Systems

The Five of Diamonds conforms to the PC Card standards for modem identification and operation. If your operating system recognizes and enables generic PC Card Plug and Play devices, the Five of Diamonds can be used.

Connecting the Five of Diamonds to the Telephone Network

The Five of Diamonds provides universal connectivity because it can connect to the telephone network using landline, cellular or DPI connection.

Landline

The direct-connect modem cable is used to connect the Five of Diamonds to an analog tip/ring phone line. Such lines are used in most households. Modem users commonly make such connections.

Cellular

The Five of Diamonds cellular model can be directly connected to a variety of popular cellular phones. To do so, an optional cellular kit is required. The cellular kit includes firmware and a direct-connect cellular cable specifically designed for the make and model of your cellular phone. For an up-to-date list of the cellular phones currently supported, please contact Ositech.

Digital Phone Interface (DPI)

Unlike most households, professional environments most commonly use digital (PBX) phone lines. Digital phone lines use a higher current than household analog landlines, and only digital phones can be plugged into digital lines. Like all modems, the Five of Diamonds is an analog modem and cannot be plugged directly into a digital phone wall jack.

Ositech's internal DPI technology overcomes this high current barrier by replacing the telephone handset with a modem. The DPI technology allows the modem to interpret the digital signals sent to the handset as data.

If you connect the Five of Diamonds to a telephone wall jack using the direct-connect modem cable, without using the DPI adapter, and the Five of Diamonds does not work, the jack is most likely for a digital phone line. Attempt a connection using the DPI adapter. Attempt this procedure before contacting Ositech's Technical Support department.

The capability to connect directly to the telephone network using any of the methods described is how the Five of Diamonds provides true universal connectivity.

Note: If you accidentally connect your Five of Diamonds directly to a digital phone network without using the DPI adapter, the Five of Diamonds will not operate. The Five of Diamonds includes Digital Line Guard which protects the Five of Diamonds from damage. Other modems would be severely damaged (usually beyond repair) if plugged directly into a digital phone line.

The file **Appnotes.txt** contains procedures for using third party communication applications that have been successfully tested with the Five of Diamonds.

Connecting the Five of Diamonds to an Analog Telephone Jack

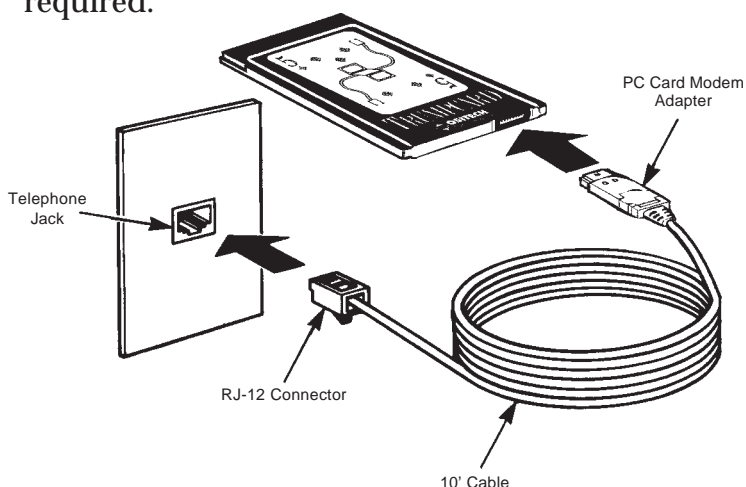
The Five of Diamonds can be connected directly to the analog landline telephone jacks found in most households.

To connect the Five of Diamonds to an analog landline telephone jack:

- 1 Plug the PC Card modem adapter into the Five of Diamonds.

Note: The PC Card modem adapter connector is keyed to go in one way only. If you feel resistance before the connector is fully inserted, remove the connector, turn it over, and re-insert it.

- 2 Plug the RJ-12 connector into the telephone jack. If you wish to have both the telephone and the Five of Diamonds connected to a single telephone jack, a telephone Y-connector is required.



The Five of Diamonds connected to an analog telephone jack.

Connecting to a Cellular Phone

The Five of Diamonds cellular model can be connected directly to a variety of popular cellular phones. To do so, an optional cellular kit is required. The cellular kit includes software and a direct-connect cellular cable specifically designed for the make and model of your cellular phone. For an up-to-date list of currently supported cellular phones, please contact Ositech Communications Inc.

Connecting Using the DPI Technology

The Five of Diamonds can connect to the telephone network via a digital phone using Ositech's built-in DPI technology. The connection is made using the coiled telephone cord which connects the handset to the base unit. The coiled telephone cord must detach from the handset to make this connection.

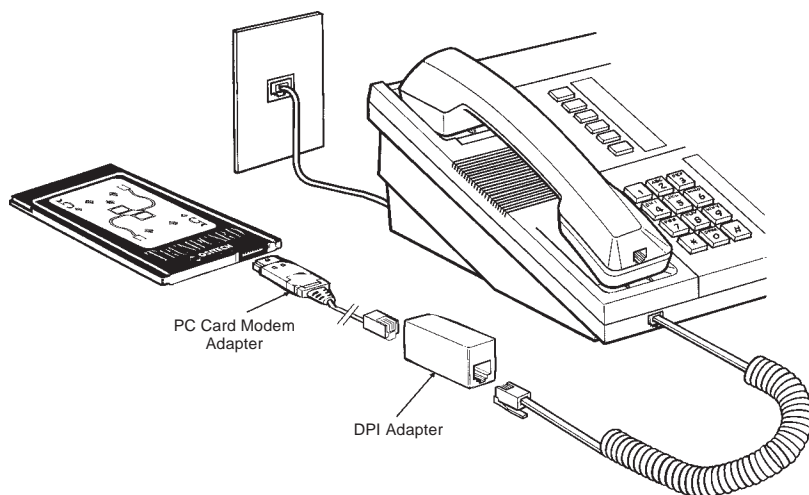
Note: Ositech's DPI technology allows the Five of Diamonds to connect and operate via a telephone handset connection. DPI technology does not allow the Five of Diamonds to operate when directly connected to a digital phone jack used to connect digital phones.

With the Five of Diamonds installed and working:

- 1 Unplug the telephone cord from the digital telephone handset jack and plug the telephone cord into the small receptacle of the DPI adapter.
- 2 Plug the PC Card modem adapter into the Five of Diamonds and the other end into the large receptacle of the DPI adapter.

Note: *The digital phone handset should not be attached to either the telephone base unit or the Five of Diamonds.*

- 3 Return the handset to the cradle.

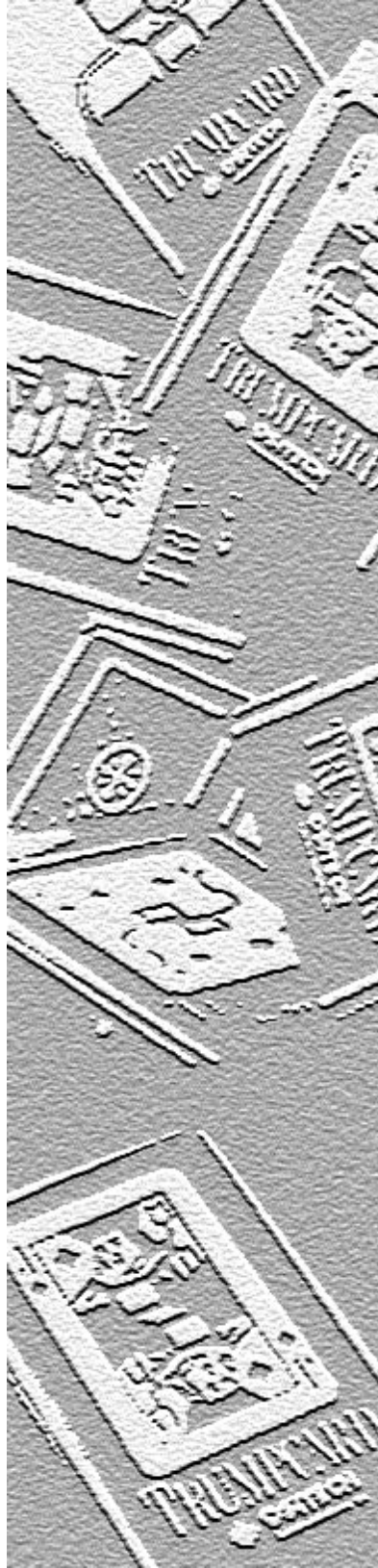


The Five of Diamonds connected to a digital telephone.

Section Three

QuickStart

Guide to Using Your Modem



The “QuickStart Guide” provides brief procedures for using your Five of Diamonds with landline, cellular and DPI connections.

Before using your Five of Diamonds, ensure it is properly inserted in a PC Card slot in your computer, and that the Five of Diamonds is recognized and enabled as a modem. Ensure the software is installed. Refer to the section “Installing the Software” for details.

Once the necessary modem enabling software is in place, configure your communications software to work with the Five of Diamonds.

Step 1: Configuring Your Communications Software

Refer to the documentation supplied with your communications software for any information regarding modem setup. The specific configuration depends on your communications software and your computer’s operating system.

To determine which communication port to use when configuring your communications software, refer to the following sections.

Windows 95 and NT

The Five of Diamonds is associated with the user-friendly device name “Ositech 5oD 33.6K DPI Modem” under these operating systems. If your communications software does not support user-friendly device names and cannot support COM port settings, you can determine the required I/O Port and IRQ values as follows:

- 1 From the *Start Menu Settings* folder, invoke *Control Panel*.
- 2 Select *Modems*, and in the *Modems* window, select the *Diagnostics Properties* tab.
- 3 Beside the name “Ositech 5oD 33.6K DPI Modem” is the COM port association.
- 4 Configure your communications software for this COM port setting.

Once the Five of Diamonds is connected to the telephone network, the Five of Diamonds is ready for use.

Windows 3.x and Other Operating Systems

Systems that support PC Card Plug and Play services provide a utility to view the PC Cards currently installed and configured.

If your computer’s operating system has a PC Card Plug and Play utility:

- 1 Start the PC Card Plug and Play utility.
- 2 From the list of installed and configured PC Cards, select the Ositech Five of Diamonds.

- 3 View the details for the Ositech Five of Diamonds and the COM port setting associated with it.
- 4 Configure your communications software to use this COM port setting.

Once the Five of Diamonds is connected to the telephone network, the Five of Diamonds is ready for use.

If your computer's operating system does not support Plug and Play services:

- 1 Determine which COM port the Ositech installation software selected.
- 2 Start your communications software.
- 3 Select the appropriate COM port.
- 4 Configure your communications software to use this COM port setting.

Once the Five of Diamonds is connected to the telephone network, the Five of Diamonds is ready for use.

Once your communications software is configured, the Five of Diamonds can be connected to the telephone network. Refer to the section "Connecting the Five of Diamonds to the Telephone Network" for details.

Step 2: Using your Five of Diamonds

The Five of Diamonds is a cellular capable 33.6 Kbps data and fax modem. The Five of Diamonds contains Ositech's Digital Phone Interface (DPI) technology. The Five of Diamonds can connect to the telephone network using landline, cellular or DPI connections.

Using Landline Connections

To use your Five of Diamonds for data or fax operations with a landline connection:

- 1 Ensure that all required dialed digits are configured in your communications software.
- 2 Use your communications software to perform modem operations.

Using Cellular Connections

The Five of Diamonds cellular model can connect directly to a variety of popular cellular phones. To do so, an optional cellular kit is required. The cellular kit includes software and a direct-connect cellular cable specifically designed for the make and model of your cellular phone. For an up-to-date list of the currently supported cellular phones, please contact Ositech.

Before using the Five of Diamonds with a cellular connection, ensure that the Five of Diamonds is upgraded for cellular connections, and is connected to your cellular phone using the direct-connect cellular cable.

Note: *Refer to the Cellular User's Guide for any additional instructions about updating the Five of Diamonds firmware and using the Five of Diamonds with a cellular connection.*

To use your Five of Diamonds for data or fax operations with a cellular connection:

- 1 Ensure that your cellular phone is on and ready for use.
- 2 Use your communications software to perform all dialing as you normally would with landline connections.

The Five of Diamonds automatically detects a cellular phone connection and uses appropriate dialing and operating methods to connect to the telephone network.

Using the DPI for Digital Connections

Your Five of Diamonds is an analog modem which can connect, using Ositech's Digital Phone Interface (DPI) Technology, to the digital phones found in most professional environments. DPI technology supports both outgoing and incoming calls.

Ositech has developed the DPI Assistant, a Windows application and serial port driver to detect DPI connections and when required prompts you to pick up the receiver and dial manually.

Note: *The DPI Assistant is a Windows 95 application and will operate only with true 32bit Windows 95 data and fax communications software.*

Outgoing calls

DPI connections require more operator intervention than standard landline or cellular connections. This is due to the fact that the handset must be operated manually for each call, the extensive variety of digital telephone systems and their specific operation parameters.

The Five of Diamonds comes preconfigured to operate with many digital telephone systems. If you are unable to establish a DPI connection using the preset configuration, run the DPI Wizard to configure the modem for the telephone system you are using currently.

During the installation of the DPI Wizard, a DPI Assistant was also installed to make Modem DPI operation as easy as possible. DPI technology detects digital connections, whereupon the DPI Assistant displays a screen prompt to remove the telephone handset from the cradle. In some cases the DPI Assistant will prompt you to dial the telephone.

This process is transparent and does not require any application settings to be changed. When connected to a landline or cellular phone the DPI Assistant does not intervene in modem functions.

The following section details how to make a DPI connection. Before beginning, ensure the following conditions have been met:

- The Five of Diamonds is connected via the DPI adapter to a digital phone base unit (refer to the section “Connecting Using the DPI Technology” for details).
- The digital phone handset is seated in the cradle.

Placing an Outgoing Call

This procedure works with communications software, providing the DPI Assistant is installed. To use your Five of Diamonds for data or fax operations with a digital connection:

- 1 Operate your communications software as you do normally.

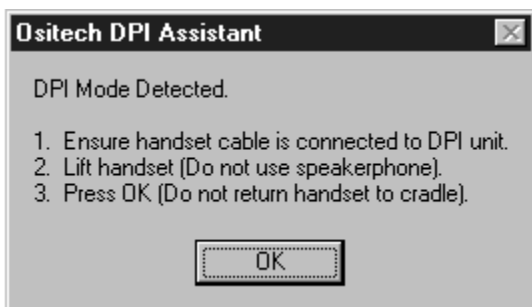
When your communications software has instructed the modem to dial, the DPI Assistant intervenes.

- 2 Follow the dialog instructions to establish the DPI connection.

If the telephone system prevents the DPI Assistant from accessing an outside line, the DPI Assistant prompts you with the number to dial.



If you use the DPI Wizard's database to select a telephone system that supports through dialing, you will be prompted only to lift the handset from the cradle.



- 3 Click **OK** to proceed with the modem connection.

You can hear the call in progress on your computer's internal speaker.

Notes: ***Do not return the handset to the cradle until the modem connection is terminated.***

If using a handsfree digital telephone, when the handset is removed from the cradle you should not hear what is occurring over the telephone line from the digital base unit.

If after multiple attempts your Five of Diamonds does not connect to the remote location you will have to configure the DPI to work with the digital telephone system to which your Five of Diamonds is currently connected. To do so, refer to the section "Configuring Your TRUMPCARD Modem for DPI Connections" for details.

Receiving an Incoming Call

Incoming calls can only be completed via manual intervention. These calls depend on your communications software more than the phone system. Most communications software use the COM port RI status indicator or the RING response string to detect an incoming call. Since the Five of Diamonds cannot detect ringing while attached to the DPI adapter, your communications software must support a manual answer mode. If a manual answer mode is not supported by your communications software, your software might not support incoming calls when operating through the DPI adapter.

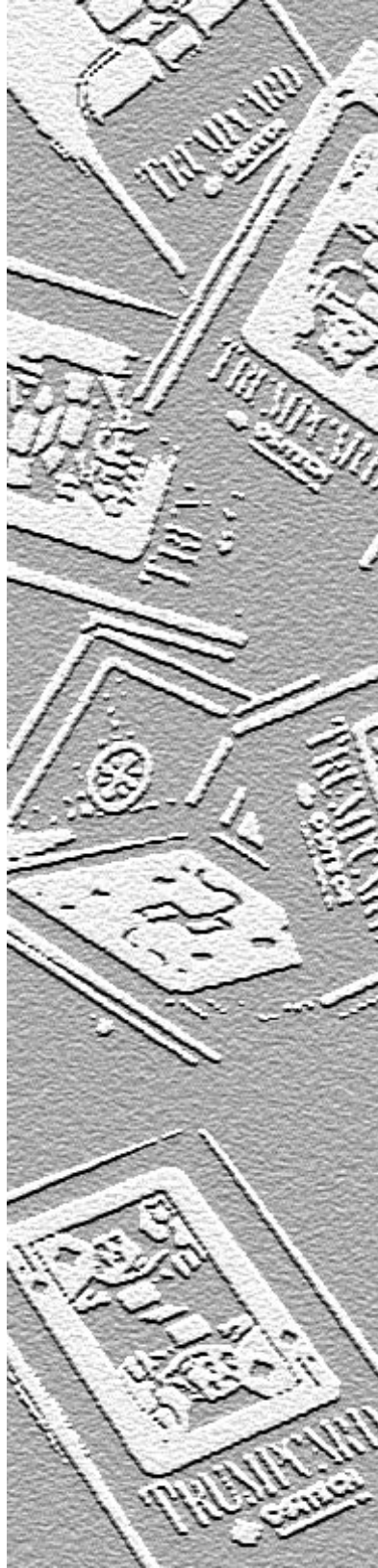
To receive incoming calls while using data communications software in terminal mode:

- 1 When the telephone base unit rings, type ATA and press *Enter*.
- 2 Remove the handset from the cradle, and place the handset beside the telephone base unit. If the ringing phone line is not automatically selected, manually select it. Wait for the modems to connect.
- 3 Use your communications software to perform modem operations.

Note: *If after multiple attempts your Five of Diamonds does not connect to the remote location you will have to configure the DPI to work with the digital telephone system to which your Five of Diamonds is currently connected. To do so, refer to the section “Configuring Your TRUMPCARD Modem for DPI Connections” for details.*

Section Four

Configuring Your TRUMPCARD Modem for DPI Connections



Digital Phone Interface (DPI) is an internal feature of the Five of Diamonds. The DPI technology allows a TRUMPCARD modem to connect to a digital telephone base unit through the telephone handset cord. This function allows TRUMPCARD modem operations to be performed when direct access to a standard analog phone line is not possible.

DPI automatically uses its default settings which work with most popular digital phone systems. Connect your TRUMPCARD modem to a digital phone and attempt a modem connection using your communications software. If the attempt does not work, the DPI settings must be adjusted for the particular telephone system and handset to which it is connected.

The optimal way to adjust the DPI settings is to use the DPI Wizard, a Windows-based application (refer to the section “DPI Wizard”).

Note: To use the advanced features of the DPI technology, run Ositech’s setup program (refer to the section, “Configuring Your TRUMPCARD Modem for DPI Connections”).

The TRUMPCARD modem will retain its most recent settings and can operate without reconfiguration provided the same telephone system and handset are used. The configuration application allows the creation of multiple Location Profiles which can be recalled and applied as needed (refer to the section “Creating Location Profiles”).

Manual Configuration

For non-Windows environment users, manual configuration instructions, including the AT command set, are included in the **confgdpi.txt** file.

DPI Wizard

Using the DPI Wizard, you can configure your TRUMPCARD modem for operation with a particular digital telephone system. This section describes how to configure your TRUMPCARD modem for use with a digital telephone system using the DPI Wizard default settings. For telephone systems not listed in the DPI Wizard's database, the DPI Wizard can be used to find modem settings which best match the characteristics of the telephone system and handset to which the TRUMPCARD modem is currently connected.

This configuration can then be applied to a Location Profile which stores the modem settings in a database unit. If you return to the same location, the Location Profile can be loaded.

System Requirements

To use the DPI Wizard you require:

- Windows 3.x, Windows 95 or Windows NT.
- 500 Kb of available hard drive space for installation.

Step 1: Installing the software

To install the Digital Phone Interface Wizard:

- 1 Insert the *DPI Wizard Installation* diskette into the 3.5" floppy drive.
- 2 Invoke the file `Setup.exe` from the Program Manager in Windows 3.x or from the Windows Explorer in Windows 95/NT.
- 3 Follow the dialog instructions.

The following steps guide you through a procedure to configure the TRUMPCARD modem for operation with the digital telephone base unit and handset to which the TRUMPCARD modem is currently connected.

Before adjusting the DPI default settings, ensure the following:

- The TRUMPCARD modem is inserted in your notebook and functioning under your computer's operating system.
- The TRUMPCARD modem is connected to a digital phone.
- The telephone's handset is seated in the cradle.

Step 2: Adjusting the DPI default settings

- 1 Start the DPI Wizard. The DPI Wizard can be invoked using the *DPI Wizard* shortcut located in the *Start Menu Programs* folder.

The *Ositech DPI Wizard* window appears.



- 2 Click *Next*. The next Wizard window opens. Continue clicking *Next* until the *Apply Location Profile* window appears.



- 3 Click *Test*. The *Perform Configured Profile Test* window appears.



- 4 Select *Fax machine to be called* or *Data/modem to be called*. The Wizard automatically defaults to *Data/modem to be called* if no selection is made.
- 5 Remove the handset from the cradle and place the handset beside the telephone base unit.

Note: *Some digital phones provide a handsfree speakerphone mode. Do not use a handsfree speakerphone mode while configuring the TRUMPCARD modem for a DPI connection.*

- 6 Dial the remote location's number (including any necessary digit to obtain an outside line—usually “9”), and click *Connect*.

One of the following messages will appear. Check the message and take the appropriate action:

Connection Established!...Hang Up!

Click *Finished* and return the handset to the cradle. The Wizard has successfully tested the new settings. The settings configured and applied to the TRUMPCARD modem can be used with your communications software.

Line busy try again later!

Wait 60 seconds and retry a connection by repeating steps 4 through 6.

Unable to Connect!

The DPI Wizard did not detect a carrier signal and could not connect to the remote modem with the current settings. The DPI Wizard offers a range of modem settings. Use the following procedure to adjust the modem settings.

- 7 In the *Perform Configured Profile Test* window, click *Back*. The *Apply Location Profile* window opens. Click *Back*.

The *Existing Location Selected* window opens.

- 8 Click *Advanced*. The *Advanced Location Profile* window opens. Click *Edit*.

The *Edit Location Name* window opens.

- 9 Click *Next*. Continue clicking *Next* until the *Edit Option Setting* window opens.

- 10 From the *Option Setting* list, select an alternate option, then click *Next*.

The *Apply Location Profile* window opens.

- 11 Click *Test*. The *Perform Configured Profile Test* window opens. Click *Connect*.

The test is repeated using the new option settings. When the test is complete, a test message appears.

- 12 If the message **unable to connect!** recurs, perform this operation by repeating steps 7 through 11 until all DPI Wizard settings are exhausted. If these attempts fail, contact Ositech's Technical Support department for assistance.

Note: Although your TRUMPCARD modem is rated at a speed of 33.6 Kbps, this speed might not be attained using certain digital telephone systems.

Step 3: Testing your communications software

- 1 Start your communications software.
- 2 Test your communications software by performing modem operations.

Ensure that you attempt a data modem connection. Use fax software to attempt a fax modem connection if required.

Your TRUMPCARD modem is now configured for the telephone system to which it is currently connected, and has been successfully tested with your communications software.

Creating Location Profiles

Using the DPI Wizard, you can configure your TRUMPCARD modem for operation by creating a Location Profile and associating it with a particular telephone base unit and handset. The DPI Wizard includes an extensive database of telephone manufacturers and models. If a profile exists for the location (e.g., a hotel or branch office), then you can load the profile. If you are using your TRUMPCARD modem in a new location, then you may create a new Location Profile.

To create a new Location Profile:

- 1 Start the DPI Wizard. The DPI Wizard can be invoked using the *DPI Wizard* shortcut located in the *Start Menu Programs* folder. Click *Next*.

The *Location Profile Options* window appears.



- 2 Select *New Location* then click *Next*.

The *New Location Profile* window opens.



- 3 Enter a name for the Location Profile. For instance, enter a name like *At the ABC Company*. When you are finished, click *Next*.

The *New Location Instructions* window opens.



- 4 Enter any pertinent information in this window. For instance, if the digital telephone for which you are configuring your modem has a speakerphone option, make a note: *disable the speakerphone option*. When you are finished, click *Next*.

The *New Location Telephone Settings* window opens. *Pre-configured Telephone System from Database* is selected.



- 5 Ensure *Pre-configured Telephone System, from Database* is selected and click *Next*.

The *Pre-Configured Telephone System* window opens.



- 6 From the lists, select the manufacturer of the digital telephone and the make or model number. When you are finished making your selections, click *Next*. If the digital telephone system you are using does not appear in the list, go to step 8.

The *Apply Location Profile* window opens.



7 Click *Finished*.

The Location Profile is now saved in the DPI Wizard's database and your TRUMPCARD modem is configured for the digital telephone system to which it is currently connected.

- 8 If the *Pre-Configured Telephone System* list does not include the digital telephone system you are using currently, click *Back*.

The *New Location Telephone Settings* window opens. *Pre-configured Telephone System from Database* is selected.

- 9 Select *Wizard, perform connection test to derive settings* and click *Next*.

The *Wizard Test Introduction* window opens.

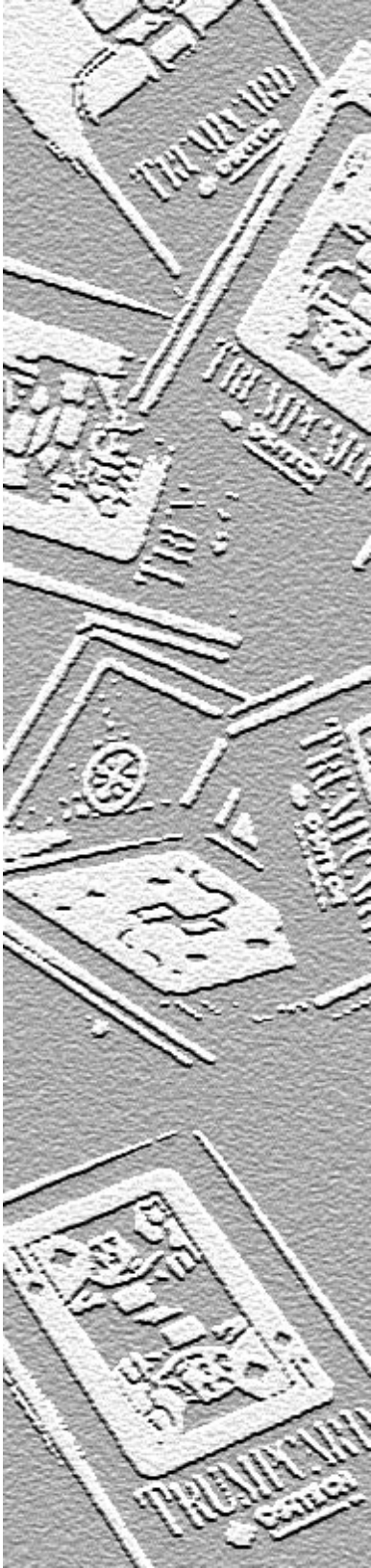


- 10 Follow the dialog instructions.

Refer to the section “DPI Wizard” for details.

Section Five

***Modem Command
Reference***



This section of the manual describes the AT commands the Five of Diamonds supports. This information includes command parameters, defaults, result codes, and examples.

AT commands cannot be entered or sent to the Five of Diamonds from the operating system command line. You must use a communications software package to communicate with the Five of Diamonds. Your communications software might handle all of the communications with the Five of Diamonds—you might never have to issue an AT command yourself. Refer to your communications software documentation for more information.

Also included in this section is a list of S registers and their functions.

At the end of the section is a list of facsimile commands supported by the Five of Diamonds. These commands appear for reference only—you cannot operate the facsimile manually.

This section covers the following:

- Modem Command Guidelines.
- Modem Command Summary.
- Modem Command Descriptions.
- Modem S Registers.
- Default Register Settings.
- Modem Register Summary.
- Register Descriptions.
- Facsimile Commands.

Modem Command Guidelines

Each of the following modem command descriptions has a list of parameters and default values. The Five of Diamonds loads the default values at initialization (when you turn the computer's power on or you issue the ATZ command). If you exclude a mandatory parameter, the Five of Diamonds assumes a zero value. Invalid commands or parameters return the **ERROR** message.

The command line contains a single command or a series of commands. You can separate commands with a space for readability, but the command line cannot exceed 41 characters. The Five of Diamonds performs the command after you send a terminating character. The default terminator is carriage return (ASCII 013), but you can change this by writing to register S3.

You can edit the command line using the backspace character (ASCII 008) or change this by writing to register S5. The backspace cannot be 0, greater than 127 or the terminating character in the command line.

All command lines begin with AT (in capital or lower case letters). A command line can be terminated at any time by issuing CTRL-X (ASCII 018). The Five of Diamonds will ignore the command line and return an **OK** message. You can use A/ to repeat the last command line. The A/ does not require a terminating character.

An escape code sequence (+++) returns the Five of Diamonds to the command mode from data mode. There must be a time delay between the last character transmitted and the first character of the escape code. You can change the delay by writing to register S12; (default 1 second). The escape code character must occur three times in succession for an escape.

Parameters that are entered for the AT and the AT& commands are limited in value to 0-255; the parameter is "MOD"ed with 256. The result must be within the specified range; if it is not, the Five of Diamonds returns an **ERROR** message.

Parameters entered for an S register are also "MOD"ed with 256. Parameters that are out of range are stored in the S register; however, no **ERROR** message is reported. Functionally the lower or higher register limit is used.

If you enter an out of range parameter for the AT\ or AT% commands, the upper limit is stored and no **ERROR** message is reported.

Following the modem command description assume **OK** and **ERROR** as valid responses for almost all of the commands. Other valid responses for a command, if any, are discussed with the command descriptions.

Modem Command Summary

Command	Title	Default
A/	Re-execute Command	none
A	Answer	none
Bn	Set ITU-T or Bell Mode	1 *
Dn	Dial	T
En	Command Echo	1 *
Fn	Select Line Modulation (14400)	none
+MS	Select Line Modulation (28800)	none
Hn	Switch-Hook Control	none
In	Identification	none
Ln	Speaker Volume	2 *
Mn	Speaker Control	1 *
Nn	Automode Detection	1 *
On	Return To The On-Line State	none
P	Set Pulse Dial As Default	none *
Qn	Result Code Display	0 *
Sn	Reading/Writing S Registers	none
T	Set Tone Dial As Default	none *
Vn	Result Code Form (Message Control)	1 *
Wn	Connect Message Control	0 *
Xn	Extended Result Codes	4 *
Yn	Control Long Space Disconnect	0 *
Zn	Reset	none
&Cn	DCD Option	0 *
&Dn	DTR Option	0 *
&F	Restore Factory Configuration	none
&Gn	Set Guard Tone	0 *
&Jn	Telephone Jack Selection	0 *
&Kn	DTE/Modem Flow Control	3 *
&Ln	Line Type	0 *

* Indicates command is saved in Non-Volatile Memory

Command	Title	Default
&Mn	Communication Mode	(&Qn) *
&Pn	Dial Pulse Ratio	0 *
&Qn	Communication Mode	5 *
&Rn	RTS/CTS Option	0 *
&Sn	DSR Option	0 *
&Tn	Test And Diagnostic	4 *
&V	View Configuration and User Profiles	none
&Wn	Store User Profile	none
&Yn	Designate Default User Profile	0 *
&Zn=x	Store Phone Number	none
\Bn	Transmit Break	3
\Gn	Modem-to-Modem Flow Control	0
\Kn	Break Control	5
\Nn	Operation Mode Control	none *
%Cn	Compression Control	1 *
%En	Disable/Enable Line Quality Monitor	0
%L	Report Received Signal Level	none
%Q	Report Line Signal Quality	none
-Kn	MNP Extended Services	1
*Hn	Link Negotiated Speed	0 *
)Mn	Transmit Level Adjust for Cellular Connection	0
:En	Compromise Equalizer	1
@Mn	Initial Cellular Power Level	0
[n	Event Based Command	None

* Indicates command is saved in Non-Volatile Memory

Modem Command Descriptions

A/ — Re-execute

Parameters	none
Default	none

Re-executes the most recent AT command string. This command must appear alone on a command line and must be terminated by the "/" character. (An Enter should not be entered to terminate the command.)

A — Answer

Parameters	none
Default	none

This must be the last command entered into the command line. The Five of Diamonds proceeds with the connect sequence in answer mode. The Five of Diamonds will enter the connected state after exchanging carrier signals with the remote modem. If no carrier is detected within the wait period specified in register S7 (default = 30 seconds), the Five of Diamonds will disconnect. Additional characters entered during the connect sequence will abort the command.

Result Codes

CONNECT XXXX	If a connection is established (XXXX = telco line speed, e.g. 2400)
NO CARRIER	If a connection cannot be established or if the command is aborted, the abort timer (register S7) expires.

Bn — Set ITU-T or Bell Mode

Parameters 0, or 1

Default 1

Selects between ITU-T and Bell modes for a 1200 bps connection.

Examples

ATB0 Selects ITU-T V.22bis and V.22 standards for communication at 2400 bps and 1200 bps.

ATB1 Selects Bell 212A for communication at 1200 bps

Dn — Dial

Parameters 0-9 A B C D * # L P T R & ! @ W , ; ^
S=n

Default P

This must be the last command on a command line. ATD causes the Five of Diamonds to go off-hook, dial according to the parameters entered and attempt to establish a connection. If there are no parameters, then the Five of Diamonds goes off-hook in originate mode without dialing the number.

Punctuation may be used for clarity. Parentheses, hyphens and spaces are ignored. If an invalid character is entered, that character and all subsequent characters in the dial string are ignored. The Five of Diamonds truncates dial strings at 40 characters.

The ATD Parameters are:

- L *Re-Dials* the last dial string.
- P *Use Pulse Dialing*. Placed at the end of the command string and before the dial string. Causes the Five of Diamonds to pulse dial the numbers.
- T *Use DTMF Dialing*. Placed at the end of the command string and before the dial string. Causes the Five of Diamonds to use DTMF tones to dial.
- R *Reverse Mode*. Allows the Five of Diamonds to call an originate-only modem by forcing the call into answer mode. Must be entered as the last character of the command string (just before Enter).
- & *Wait for calling card bong*. If bong is not detected within the time specified by S7 (default = 30 seconds), the Five of Diamonds disconnects and returns an error message.
- ! *Hookswitch Flash*. Causes the Five of Diamonds to go on-hook for 700 milliseconds, then off-hook.
- @ Causes the Five of Diamonds to listen for 5 seconds of silence. If a 5 second silence has not been detected within the period specified in S7 (default = 30 seconds), the Five of Diamonds disconnects and returns the **NO ANSWER** result code. If it detects a busy signal, it returns a **BUSY** result code. If the 5 seconds of silence is detected, then the Five of Diamonds continues dialing the dial string.

- W *Wait For Dial Tone Before Dialing.* Causes the Five of Diamonds to wait for a dial tone up to the period of time specified in register S7 (default = 30 seconds) before dialing the numbers that follow. If the Five of Diamonds detects a dial tone before the given time delay, it continues to dial. Otherwise, it goes on-hook.
- , *Pause During Dial.* Inserted between digits in a dial string. Causes the Five of Diamonds to pause for the value given by register S8 (default = 2 seconds), before dialing the next digit. This delay can be used in place of the "Wait For Dial Tone Before Dialing", but is not as sophisticated.
- ; *Return To Command Mode After Dialing.* Added to the end of a dial string. Causes the Five of Diamonds to remain in the command mode after it dials the digits proceeding the command. This allows the user to issue additional dial commands or dial strings without overflowing the command buffer. The Five of Diamonds looks for the carrier after the final dial command is issued. The Command ATHn aborts this command.
- ^ *Turn On Calling Tone.* Turns on the periodic 1300 Hz calling tone if originating the call. Calling tone is enabled only on a call-by-call basis.
- S=n *Dial Stored Number.* Follows the dial command string. Causes the Five of Diamonds to dial a telephone number previously stored in directory location n using &Zn command.

If ATD is entered without parameters, the Five of Diamonds goes off-hook and waits for a carrier; if the handshake is not completed within the specified time by register S7 (default = 30 seconds), the Five of Diamonds goes on-hook.

The Dial command will be aborted in progress upon receipt of any character before completion of the handshake.

Examples

ATDT1-800-555-1212	Dial long distance number
ATDT9,555-4444	Inserted pause
ATDS=2	Dial stored number

Result Codes

NO DIAL TONE	If X2 or X4 is selected and 1 second of dial tone is not detected within 5 seconds, or if W dial modifier is used and 3 seconds of dial tone is not detected within the time specified by S7.
BUSY	If a busy signal is detected, and X3 or X4 is selected or if dial modifier is used.
NO ANSWER	If "@" dial modifier is used and 5 seconds of silence are not detected within the time specified by S7.
CONNECTXXXX	If a connection is established.
NO CARRIER	If a connection cannot be established or a character is entered during the handshake process, the abort timer (register S7) expires.

En — Command Echo

Parameters 0 or 1

Default 1

Controls the echo of characters received by the modem while the Five of Diamonds is in the command mode. If both the Five of Diamonds and the software have echo on, double characters will appear. If no characters appear, then both character echoes are off.

Examples

ATE0 Inhibits the echoing of commands

ATE1 Enables the echoing of commands

Fn - Select Line Modulation (14400 only)

Parameters 0 through 10, 13 through 19

Default 0

This command can be used to assure a connection is made only at the specified speed.

Examples

ATF0 Selects auto-detect mode (equivalent to N1 command).

ATF1 Permit V.21 or Bell 103 connections only based on ATBn setting.

ATF2 Reserved.

ATF3 Permit V.23 1200/75 bps connections only.

ATF4 Permit V.22 1200 bps connections only.

ATF5 Permit V.22bis 2400 bps connections only.

ATF6	Permit V.22bis or V.32 4800 bps connections only.
ATF7	Permit V.32bis or V.32 7200 bps connection only.
ATF8	Permit V.32bis or V.32 9600 bps connections only.
ATF9	Permit V.32bis 12000 connections only.
ATF10	Permit V.32bis 14400 bps connections only.
ATF13	Permit V.FC 14400 bps connection only *
ATF14	Permit 16800 bps connections only *
ATF15	Permit 19200 bps connections only *
ATF16	Permit 21600 bps connections only *
ATF17	Permit 24000 bps connections only *
ATF18	Permit 26400 bps connections only *
ATF19	Permit 28800 bps connections only *

** Only applicable to TRUMPCARD 28800 version*

+Ms Select Line Modulation (28800 only)

Parameters 0 through 3, 9 through 11, 64, 69, 74

Default 11

This extended-format command selects the modulation, optionally enables or disables automode, and optionally specifies the lowest and highest connection rates using one to four sub-parameters. The command format is:

+MS=<mod>[,<automode>][,<min.rate>][,<max_rate>]]<CR>

Sub-parameter Definitions

1. <mod> = A decimal number which specifies the preferred modulation (automode enabled) or the modulation (audomode disabled) to use in originating or answering a connection. The options are:

w<mod>	Modulation	Possible Rates
0	V21	300
1	V22	1200
2	V.22	2400 or 1200
3	V.23	1200
9	V.32	9600 or 4800
10	V.32	14400, 12000, 9600, 7200, or 4800
11	V.34	28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400
64	Bell 103	300
69	Bell 212	1200
74	VFC	28800, 26400, 24000, 21600, 16800, or 14400

2. <automode> = An optional numeric value which enables or disables automatic modulation negotiation using V.8 or V.32bis annex a. The options are:

<automode> Option Selected
Notes

0	Automode disabled
1	Automode enabled using V.8 or V32bis annex A Default

3. <min_rate> = An optional number which specifies the lowest rate at which the Five of Diamonds may establish a connection. The value is decimal coded in units of bps, e.g., 2400 specifies the lowest rate to be 2400 bps. The default is 300 for 300 bps.

4. <max_rate> is an optional number which specifies the highest rate at which the Five of Diamonds may establish a connection the value is decimal coded, in units of bps, eg., 14400 specifies the highest rate to be 14400 bps. The default is 28800 for 28800 bps.

Hn — Switch-Hook Control

Parameters	0 or 1
Default	0

If the user enters the command mode from the data mode issuing the escape sequence (+++), or as a result of an ON-to-OFF transition of DTR with the &D1 option in effect, the user may cause the Five of Diamonds to go on-hook by issuing the H0 command.

Examples

ATH0	Causes the Five of Diamonds to go on-hook.
ATH1	If the Five of Diamonds is on-hook, Five of Diamonds goes off hook, the returns an OK response, and awaits further commands.

In — Identification

Parameters	0 - 6
Default	0

Returns the product code, the checksum of the firmware ROM, or computes the checksum of the firmware ROM and reports its error status. Each product code contains 3 digits. The checksum result consists of three ASCII numeric characters followed by a carriage return and a line feed. The error status line is either OK or ERROR.

Examples

ATI0	Reports the product code.
ATI1	Reports the checksum computed on the firmware ROM.
ATI2	Performs a checksum on the firmware ROM and indicates OK or ERROR.
ATI3	Reports firmware manufacturer identification.
ATI4	Reports product identification.
ATI5	Reports country code.
ATI6	Reports hardware configuration.

Ln — Speaker Volume

Parameters	0, 1, 2, or 3
Default	2

Controls the internal speaker volume.

Examples

ATL0	Selects low speaker volume.
ATL1	Selects low speaker volume.
ATL2	Selects medium speaker volume.
ATL3	Selects high speaker volume.

Mn — Speaker Control

Parameters	0, 1, 2, or 3
Default	1

Selects when the speaker will be on or off.

Examples

ATM0	Speaker is always off.
ATM1	Speaker is on during call establishment, but off when connected to a remote modem.
ATM2	Speaker is always on.
ATM3	Speaker is off when dialing or connected to a remote modem, but on during call answering.

Nn — Automode Detection

Parameters	0 or 1
Default	1

This command enables or disables automode detection.

Examples

ATN0	Automode detection is disabled. Subsequent connections will be based on the setting in Register S37, if S37=0 the speed of the connection must match that at which the last AT command was issued.
ATN1	Automode detection is enabled. Connections will be based on an automode algorithm. This command is equivalent to F0 command.

On — Return To The On-Line State

Parameters 0 or 1

Default none

If the user enters the command mode from the data mode by issuing the escape sequence, or as a result of an ON-to-OFF transition of DTR with the &D1 option in effect, the user may return to the data mode without terminating a call by issuing the O0 command. This command may also be used to force a retrain. If the Five of Diamonds is on-hook, then it behaves as if it went off-hook without *actually* taking the relay off-hook.

Examples

ATO0 Causes the Five of Diamonds to return to the data mode.

ATO1 Causes the Five of Diamonds to return to the data mode and to initiate a retrain when operating at 2400 bps. Also, adjusts the transmit level at 2400 bps to the -Un setting.

Result Codes

CONNECT XXXX If a connection is established.

NO CARRIER If retrain is not successful in the time specified by S7.

P — Set Pulse Dial as Default

Parameters none

Default none

Causes the Five of Diamonds to assume all subsequent dial commands are pulse dialed. The users can omit the "P" from the dial strings.

Qn — Result Code Display

Parameter	0 or 1
Default	0

Determines whether or not the Five of Diamonds returns the result codes (see Xn command).

Examples

ATQ0	Allows the Five of Diamonds to return result codes.
ATQ1	Prohibits the Five of Diamonds from returning result codes.

Sn — Read/Write S Registers

Parameters	n = 0-95 x = 0-255
Default	none

Selects a S register, reads or writes the contents of a S register or reports the value of a S register. All the S registers may be read. If no parameter is entered, S0 is assumed. The “S” can be omitted to assume the last S-register accessed.

All the registers return the OK response if x is a legal value; some registers will not actually write the value anywhere.

If the parameter number is beyond the range of the available S-registers, the Five of Diamonds will return the ERROR message. The value x is “MOD”ed with 256, and if the result is outside the range permitted for a given S-register, the values will still be stored, but functionally, the lower and higher limits will be observed. Input and output is always in decimal format. Note that some S-registers are read-only.

In some cases, writing to the S-register will appear to be accepted but the value will not actually be written.

Examples

ATSn	Establishes S-register <i>n</i> as the default register.
ATSn=x	Set S-register <i>n</i> to the value <i>x</i> .
ATSn?	Reports the value of S-register <i>n</i> .

T — Set Tone Dial as Default

Parameters: none

Default: none

Causes the Five of Diamonds to assume that all subsequent dial commands are tone dialed. The user may omit the “T” from the dial string.

Vn — Result Code Form

Parameters 0 or 1

Default 1

Selects whether the Five of Diamonds returns long form or short form result codes. All responses are ASCII values. Long-form (verbose) responses are preceded and terminated with both carriage return and line feed control characters. Short-form (numeric) responses are terminated only with a carriage return control character (see Xn command).

Examples

ATV0	Allows short-form (numeric) result codes to be sent.
ATV1	Allows long-form (verbose) result codes to be sent.

Wn — Connect Message Control

Parameters 0, 1, or 2

Default 0

Controls which message(s) are reported upon connection. These messages can also be reported in either numeric or verbose form. For example, both 77 and PROTOCOL:LAP-M indicate the error-correction protocol is LAP-M. (See Xn command).

Examples

ATW0 Upon connection report CONNECT XXXX only.

ATW1 Upon connection report CARRIER XXXX, PROTOCOL XXXX and CONNECT XXXX.

ATW2 Upon connection report CONNECT XXXX only.

Xn — Extended Result Codes

Parameters 0, 1, 2, 3, or 4

Default 4

Determines whether the Five of Diamonds responds to dial tone and busy signals, and how it displays result codes for **CONNECT** messages. When the Five of Diamonds ignores dial tone, it waits for a time delay given by register S6 (default = 2 seconds) and then dials regardless of the presence or absence of dial tone; this is called blind dialing.

Examples

ATX0	Five of Diamonds ignores dial tone and busy signal. Sends only OK, CONNECT, RING, NO CARRIER, ERROR and NO ANSWER result codes. Connection is established by blind dialing.
ATX1	Same as X0 with the addition of sending CONNECT XXXX (XXXX = rate) result codes.
ATX2	Five of Diamonds ignores busy signal but waits for dial tone. Sends only OK, CONNECT, RING, NO CARRIER, ERROR, NO ANSWER, NO DIALTONE and CONNECT XXXX (XXXX = rate) result codes. Dialtone must be detected within 5 seconds.
ATX3	Five of Diamonds ignores dial tone but monitors for busy signals. Sends only OK, CONNECT, RING NO CARRIER, ERROR NO ANSWER, BUSY and CONNECT XXXX (XXXX= rate) result codes. Connection is established by blind dialing.
ATX4	Five of Diamonds monitors dialtone and busy signals. All result codes are enabled.

Result Codes — Q0, V1, Wn, S95

Short Form	Long Form	n Value in ATXn Command				
		0	1	2	3	4
0	OK	X	X	X	X	X
1	CONNECT	X	X	X	X	X
2	RING	X	X	X	X	X
3	NO CARRIER	X	X	X	X	X
4	ERROR	X	X	X	X	X
5	CONNECT 1200		X	X	X	X
6	NO DIAL TONE			X		X
7	BUSY				X	X
8	NO ANSWER	X	X	X	X	X
9	CONNECT 0600		X	X	X	X
10	CONNECT 2400		X	X	X	X
11	CONNECT 4800		X	X	X	X
12	CONNECT 9600		X	X	X	X
13	CONNECT 7200		X	X	X	X
14	CONNECT 12000		X	X	X	X
15	CONNECT 14400		X	X	X	X
16	CONNECT 19200		X	X	X	X
17	CONNECT 38400		X	X	X	X
18	CONNECT 57600		X	X	X	X
19	CONNECT 115200		X	X	X	X
22	CONNECT 75TX/1200R	X	X	X	X	
23	CONNECT 1200TX/75RX		X	X	X	X
40	CARRIER 300	X	X	X	X	X
44	CARRIER 1200/75	X	X	X	X	X
45	CARRIER 75/1200	X	X	X	X	X
46	CARRIER 1200	X	X	X	X	X
47	CARRIER 2400	X	X	X	X	X
48	CARRIER 4800	X	X	X	X	X
49	CARRIER 7200	X	X	X	X	X
50	CARRIER 9600	X	X	X	X	X

Note: *Carrier, Compression and Protocol messages controlled by W command and S95.*

Short Form	Long Form	n Value in ATXn Command				
		0	1	2	3	4
51	CARRIER 12000	X	X	X	X	X
52	CARRIER 14400	X	X	X	X	X
53	CARRIER 16800 *	X	X	X	X	X
54	CARRIER 19200 *	X	X	X	X	X
55	CARRIER 21600 *	X	X	X	X	X
56	CARRIER 24000 *	X	X	X	X	X
57	CARRIER 26400 *	X	X	X	X	X
58	CARRIER 28800 *	X	X	X	X	X
59	CONNECT 16800 *		X	X	X	X
61	CONNECT 21600 *		X	X	X	X
62	CONNECT 24000 *		X	X	X	X
63	CONNECT 26400 *		X	X	X	X
64	CONNECT 28800 *		X	X	X	X
66	COMPRESSION: CLASS 5	X	X	X	X	X
67	COMPRESSION: V.42BIS	X	X	X	X	X
69	COMPRESSION: NONE	X	X	X	X	X
76	PROTOCOL: NONE	X	X	X	X	X
77	PROTOCOL: LAP-M	X	X	X	X	X
80	PROTOCOL: ALT	X	X	X	X	X
81	PROTOCOL: ALT - CELLULAR	X	X	X	X	X

Note: Carrier, Compression and Protocol messages controlled by W command and S95.

** Only applicable to TRUMPCARD 28800 version*

Yn — Control Long Space Disconnect

Parameters 0 or 1
Default 0

Enable/disable the generation and response to long space disconnect.

Examples

ATY0	Disable long space disconnect.
ATY1	Enable long space disconnect. In non-error correction mode, a four second break will be sent prior to going on-hook. In error correction mode, the Five of Diamonds will be on-hook when it receives a continuous break greater than 1.6 seconds.

Zn — Reset

Parameters	0 or 1
Default	0

Causes the Five of Diamonds to disconnect and performs a warm start. This command must be the last command on the command line. The reset actions are 1) Clear serial port buffers; 2) Set the baud rate and parity to match when any AT command is issued; 3) Restore the active configuration with the user profile denoted by the parameter; and 4) clear event based command buffers. The parameter *n* indicates which factory default values are to be loaded. Currently, the factory defaults for 0 and 1 are the same.

&Cn — DCD Option

Parameters	0 or 1
Default	0

Controls the Received Line Signal Detected (/RLSD) [Carrier Detect (DCD)] signal of the serial port.

Examples

AT&C0	RLSD is ON regardless of the state of the data carrier from the remote modem.
AT&C1	RLSD follows the state of the data carrier from the remote modem.

&Dn — DTR Option

Parameters	0, 1, 2, or 3
Default	0

Determines actions taken by the Five of Diamonds in relation to the Data Terminal Ready (/DTR) signal of the serial port. The effect of /DTR loss depends upon the &D and &Q (&M) commands.

The action for the event that follows /DTR loss is indicated in the following table:

	&D0	&D1	&D2	&D3
&Q0	NONE	2	3	4
&Q1	1	2	3	4
&Q2	3	3	3	3
&Q3	3	3	3	3
&Q4	1	2	3	4
&Q5	NONE	2	3	4
&Q6	NONE	2	3	4

The DTR-going-off events corresponding to the action numbers in the above table are:

- 1 Five of Diamonds disconnects and sends OK result code.
- 2 Five of Diamonds goes into command mode if in data mode and sends the OK result code.
- 3 Five of Diamonds disconnects, sends the OK result code, and disables auto answer while /DTR is OFF.
- 4 Five of Diamonds performs a warm start (e.g., Z command).

&F — Restore Factory Configuration

Parameters none

Default none

Loads the Five of Diamonds' active configuration area with the factory default values.

&Gn — Set Guard Tone

Parameters 0, 1, or 2

Default 0

Normally, controls the generation of guard tone. This command is not implemented, but the command structure is provided for application compatibility.

&Jn — Telephone Jack Selection

Parameters 0 or 1

Default 0

The command structure is provided for application compatibility only and performs no function.

&Kn — DTE/Modem Flow Control

Parameters	0, 3, 4, 5 or 6
Default	3

Determines how the Five of Diamonds controls the flow of data between the communications software and the Five of Diamonds. When the Five of Diamonds terminal buffer is nearly full, the Five of Diamonds will either send an XOFF command, or drop CTS to stop the data flow. When the buffer is nearly empty, the Five of Diamonds will either send an XON command or raise CTS to start the data flow.

The Five of Diamonds responds to XON/XOFF characters or RTS stimulus from the communications software by suspending or resuming transmission accordingly. The Five of Diamonds responds to XON/XOFF characters and also passes the XON/XOFF characters to the remote modem as data if transparent flow control is selected. When in Direct mode (&Q0), flow is not used and the Five of Diamonds ignores the setting of this command.

Examples

AT&K0	Disables flow control.
AT&K3	Enables RTS/CTS flow control.
AT&K4	Enables XON/XOFF flow control.
AT&K5	Enables transparent XON/XOFF flow control.
AT&K6	Enables RTS/CTS and XON/XOFF flow control.

&Ln — Line Type

Parameters	0 or 1
Default	0

Controls selection of leased line or dial-up line. Although the Five of Diamonds has only a single line connection, the power level is changed when setting leased line operation.

Examples

AT&L0	Dial-up line.
AT&L1	Leased line.

&Mn — Communication Mode

Parameters	0
Default	None

Same as &Q0.

&Pn — Dial Pulse Ratio (disabled for the U.S.)

Parameters	0,1, 2 or 3
Default	0

Selects the ratio of the off hook (make) to an on-hook (break) interval used when pulse dialing.

Examples

AT&P0	39%/61% make/break ratio @ 10 pps.
AT&P1	33%/67% make/break ratio @ 10 pps.
AT&P2	33%/67% make/break ratio @ 20 pps.
AT&P3	33%/67% make/break ratio @ 20 pps.

&Qn — Communication Mode

Parameters	0, 4 through 6
Default	5

The Five of Diamonds supports three basic communication modes: asynchronous, autosync, and error correction.

Examples

AT&Q0	Selects asynchronous operation in the Direct mode. In this mode, the communications software speed must match the telco line speed.
AT&Q4	Selects AutoSync operation and is used in conjunction with communications software that is compatible with the Hayes Synchronous Interface (HSI).
AT&Q5	Selects error correction mode. The Five of Diamonds negotiates an error-correction link. The Five of Diamonds can be configured to either disconnect or fallback to a normal asynchronous connection if the link cannot be negotiated (refer to register S36). &Q5 and S36=0 Same as \N2 command (no fallback). &Q5 and S36=1 Same as \N3 command (fallback).
AT&Q6	Selects asynchronous operation in Normal mode (Speed Buffering). In this mode, the communications software speed can differ from the telco line speed.

&Rn — RTS/CTS Option

Parameters 0 or 1

Default 0

Controls the state of the Clear To Send (/CTS) signal operation, this can be altered if hardware flow control is enabled. (see &K command).

Examples

AT&R0 CTS acts according to V.25bis handshake (i.e. /CTS tracks /RTS [Request To Send]).

AT&R1 The Five of Diamonds ignores /RTS;/CTS is always ON.

&Sn — DSR Option

Parameters 0 or 1

Default 0

Determines whether Data Set Ready (/DSR) operates in accordance with EIA-232-D specification or remains ON.

Examples

AT&S0 DSR is always ON.

AT&S1 DSR is turned ON at start of handshaking and OFF when carrier is lost.

&Tn — Test and Diagnostic

Parameters 0, 1, or 3 through 8

Default 4

Selects the test command. Test commands must be initiated in the command mode with asynchronous operation in the Direct mode selected (&Q0) at a speed of less than 14400 or 28800 (28800 version only).

A telco line connection must be established prior to initiating digital loopback tests. If these conditions are not met, the Five of Diamonds issues the ERROR result code. If local analog loopback is initiated while the Five of Diamonds is connected, the Five of Diamonds disconnects before performing the test.

An initiated test is active for the period of time specified by register S18 (test timer) before it returns to the command mode. If S18 is zero, the test aborts when the user issues the &T0 command.

Examples

AT&T0 End test in progress. The escape sequence (+++) must be issued to return the Five of Diamonds to the command mode prior to sending this command. Subsequent issuing of the *O* command while in the command mode will cause the local and remote modems to return to normal data mode operation if the interrupted test was digital loopback.

AT&T1 Initiates local analog loopback. This test verifies the working condition of the path between the local communications software and the local modem. The characters received from the communications software are looped back by the modem.

AT&T3	Initiates remote digital loopback locally. The characters received from the remote modem are looped back to the remote modem by the local modem. This test verifies the working condition of the path from a remote modem, through a local modem, and back to the remote modem.
AT&T4	Allows the Five of Diamonds to respond to a request from a remote modem for a remote digital loopback test.
AT&T5	Prohibits the Five of Diamonds from granting a request from a remote modem for a digital loopback test.
AT&T6	Initiates remote digital loopback. The characters received from the local communications software are transmitted to the remote modem and looped back from the remote modem to the local modem. This test verifies the working condition of the path between the local communications software and the remote modem.
AT&T7	Initiates remote digital loopback with self test. This works similarly to &T6 except that the Five of Diamonds sends an alternating zeros and ones (0101) test pattern to the remote modem and continuously examines the validity of the returned data. The Five of Diamonds adds to an internal error counter each time an error is detected. At the completion of the test, the Five of Diamonds returns a 3-digit error count.

AT&T8

Initiates local analog loopback with self test. This test works similarly to &T7 except that the test pattern is checked in the local analog loopback mode (as in &T1). This allows a thorough testing of the local modem transmit and receive functions without an actual telco line connection.

&V — View Configuration and User Profiles

Parameters none

Default none

Displays the active configuration and user profiles.

Example

AT&V

ACTIVE PROFILE:

B1 E1 L2 M1 N1 Q0 T V1 W0 X4 Y0 &C0 &D0
&G0 &J0 &K3 &Q5 &R0 &S0 &T4 &X0 &Y0

S00:000 S01:000 S02:043 S03:013 S04:010
S05:008 S06:002 S07:030 S08:002 S09:006
S10:014 S11:095 S12:050 S18:000 S25:005
S26:001 S36:007 S37:000 S38:020 S44:020
S46:138 S48:007 S49:008 S95:000

STORED PROFILE 0:

B1 E1 L2 M1 N1 V1 W0 X4 Y0 &C0 &D0 &G0 &J0
&K3 &Q5 &R0 &S0 &T4 &X0

S00:000 S02:043 S06:002 S07:030 S08:002
S09:006 S10:014 S11:095 S12:050 S18:000
S36:005 S37:000 S40:105 S41:135 S46:138
S95:000

STORED PROFILE 1:

B1 E1 L2 M1 N1 V1 W0 X4 Y0 &C0 &D0 &G0 &JO
&K3 &Q5 &R0 &S0 &T4 &X0

S00:000 S02:043 S06:002 S07:030 S08:002
S09:006 S10:014 S11:095 S12:050 S18:000
S36:005 S37:000 S40:105 S41:135 S46:138
S95:000

TELEPHONE NUMBERS:

0= 1=

2= 3=

&Wn — Store User Profile

Parameters 0 or 1

Default none

Saves the current configuration into non-volatile memory as one of two user profiles. These settings are restored to the active configuration upon receiving an Zn command or at power up (see &Y command). The user profile saved is denoted by the parameter value. This command will yield an **ERROR** message if unable to store the current configuration in non-volatile memory.

Examples

AT&W0 Save as user profile 0.

AT&W1 Save as user profile 1.

&Yn — Designate Default User Profile

Parameters 0 or 1

Default 0

Designates which of two user profiles will be loaded into the active configuration at power up. The user profile is denoted by the parameter value.

Examples

AT&Y0 Selects user profile 0.

AT&Y1 Selects user profile 1.

&Zn=x — Store Phone Number

Parameters n = 0, 1, 2, or 3, x = dial string

Default none

Stores a 36-digit dial string (x) in the specified entry (n) for later dialing. (See DS_n command).

\Bn — Transmit Break

Parameters 1 through 9 (If n = 0, the default value is used; if n is greater than 9, 9 is used.)

Default 3

When this command is entered during a non-error correction connection, the modem sends a break signal to the remote modem. The length of the break is 100 times the n parameter value in milliseconds. If this command is entered during an error-correcting connection, the break will be sent via the error-correcting protocol giving no indication of length.

Result Codes

NO CARRIER If not connected.

\Gn — Modem-to-Modem Flow Control

Parameters 0 or 1

Default 0

The command applies in non-error correction mode; the Five of Diamonds enables or disables the generation or recognition of Modem-to-Modem XON/XOFF flow control.

Examples

AT\G0 Disables Modem-to-Modem flow control.

AT\G1 Enables Modem-to-Modem flow control.

\Kn — BREAK Control

Parameters 0 through 5 (If n is greater than 5, 5 is used.)

Default 5

Determines what the Five of Diamonds will do when a BREAK is received from the communications software or the remote modem. In error correction mode, the remote modem's BREAK control setting determines how the local modem will handle the BREAK.

Examples

When a BREAK is received from the communications software when connected to a remote modem, the Five of Diamonds takes the following action:

- AT\K0,2,4 Five of Diamonds enters the command mode (waiting for AT) without sending a BREAK to the remote modem.
- AT\K1 Five of Diamonds clears the terminal and Five of Diamonds buffers and sends a BREAK to the remote modem.
- AT\K3 Five of Diamonds does not clear the buffers but sends a BREAK to the remote modem.
- AT\K5 Five of Diamonds sends a BREAK to the remote modem in sequence with any transmitted data.

When a BREAK is received from the remote modem during a non-error correction connection, the Five of Diamonds takes the following action:

- AT\K0,1 Five of Diamonds clears the terminal and Five of Diamonds buffers and sends a BREAK to local communications software.
- AT\K2,3 Five of Diamonds does not clear buffers but sends a BREAK to the local communications software.
- AT\K4,5 Five of Diamonds sends a BREAK in sequence with any data being buffered, to the local communications software.

When a \B command is received from the communications software during a connection and in the Command mode, the Five of Diamonds takes the following action:

AT\K0,1	Five of Diamonds clears the terminal and Five of Diamonds buffers and sends a BREAK to the remote modem.
AT\K2,3	Five of Diamonds does not clear buffers but sends a BREAK to the remote modem.
AT\K4,5	Five of Diamonds sends a BREAK in sequence with any data being buffered, to the remote modem.

\Nn — Operation Mode Control

Parameters	0, 1, 2, 3, 4, or 5
Default	3

Selects the operating mode the Five of Diamonds uses while connected (see &Qn command).

Examples

AT\N0	Selects Normal (speed buffering) mode. This option takes effect at physical connection time.
AT\N1	Same as AT\N0.
AT\N2	Selects reliable link mode. This defines the modem-to-modem connection to require error correction connection. If an attempt to establish the reliable link fails, the Five of Diamonds disconnects.

AT\N3	Selects auto-reliable link mode. The Five of Diamonds will attempt an error-correction connection but will fallback to Normal mode if unable to establish an error correcting connection. This command takes effect at physical connection time only.
AT\N4	Selects LAPM error-correction mode. The Five of Diamonds will attempt a LAPM error-correction connection. If the attempt fails, the Five of Diamonds disconnects.
AT\N5	Selects MNP error-correction mode. The Five of Diamonds will attempt a MNP error-correction connection. If the attempt fails, the Five of Diamonds disconnects.

%Cn — Compression Control

Parameters: 0, 1, 2, or 3

Default 3

Enables or disables data compression negotiation. The Five of Diamonds can only perform data compression on an error-correcting link.

Examples

AT%C0	Disables data compression.
AT%C1	Enables MNP 5 data compression.
AT%C2	Enables V.42bis data compression.
AT%C3	Enables both MNP 5 and V.42bis data compression.

%En — Enable/Disable Line Quality Monitor

Parameters	0-3
Default	2

Controls whether or not the Five of Diamonds will automatically monitor the line quality and request a retrain, fall back when line quality is insufficient, or fall forward if line quality is sufficient.

Examples

AT%E0	Disable line quality monitor.
AT%E1	Enable line quality monitor and auto-retrain.
AT%E2	Enable line quality monitor and fall back / fall forward.
AT%E3	Enable line quality monitor and auto-retrain, but hang-up immediately when EQM reaches hang-up threshold.

%L — Report Received Signal Level

Parameters	none
Default	none

Returns a value identifying the received signal level. The possible values are:

- 009 = Received level of -9 dBm
- 010 = Received level of -10 dBm
- 011 = Received level of -11 dBm
- .
- .
- .
- 043 = Received level of -43 dBm

If the received level is greater than -9 dBm, 009 will be reported. If the received level is less than -43 dBm, 043 will be reported.

%Q — *Report Line Signal Quality*

Parameters none

Default none

Returns the high-order byte of the calculated Eye Quality Monitor (EQM) value. The value for a normal connection ranges from about 0 to 2 and approaches 8 for a progressively poorer connection.

-Kn — *MNP Extended Services*

Parameters 0, 1 or 2

Default 1

Enables the Five of Diamonds to investigate its MNP10 capacity, and determine whether a V.42 LAPM connection will be converted to an MNP connection. When -K1 is set on both Five of Diamonds s, a LAPM connection will be converted to an MNP10 connection.

Examples

AT-K0 Disable V.42 LAPM to MNP 10 conversion.

AT-K1 Enable V.42 LAPM to MNP 10 conversion.

AT-K2 Enable V.42 LAPM to MNP 10 conversion; inhibit MNP extended services initiation during V.42 LAPM detection phase.

**Hn — Link Negotiation Speed*

Parameters	0, 1 or 2
Default	0

Sets the connection speed for link negotiation before upshift occurs between modems. When poor telephone lines are anticipated, the *H1 command should be used to set the connection speed to 1200 bps to facilitate link negotiation. If this command is set to 1 and the Five of Diamonds connects in LAPM, the connection speed will be fixed at 1200 bps.

Examples

AT*H0	Link negotiation occurs at the preferred line speed.
AT*H1	Link negotiation occurs at 1200 bps.
AT*H2	Link negotiation occurs at 4800 bps.

)Mn — Transmit Level Adjustment for Cellular Connection

Parameters	0 or 1
Default	0

Enables adjustment of the transmit levels base unitd on attenuation and possibly signal-to-noise ratio of the line to minimize the "clipping". The transmit levels are adjusted only when retrain and speed shift are performed.

Examples

AT)M0	No transmit level adjustment, fixed at -10 dBm [adjust power level if remote is set to)M1].
-------	----------------------------------------------------------------------------------------------

AT)M1 Adjust transmit level during retrain speed shift.

:En — Compromise Equalizer

Parameters 0 or 1

Default 1

Enables or disables the V.32 compromise equalizer.

Examples

AT:E0 Disable the equalizer.

AT:E1 Enable the equalizer.

@Mn — Initial Cellular Power Level

Parameters 0 - 31

Default 0 (-26dBm)

Sets the initial power level for upshift at connect until line conditions can be determined.

Examples

AT@M0 -26dBm.

AT@M1 -30dBm.

AT@M2-@M10 -10dBm.

AT@M11 -11dBm.

AT@M12 -12dBm.

.

.

.

AT@M30 -30dBm.

AT@M31 -31dBm.

[n init string] — Event Base unitd Command

Parameters	$n = 0$ or 1 <i>init string</i> = any valid AT command(s) except Z (reset)
Defaults	$n = 0$ <i>init string</i> = NULL

The event base unitd command allows single or multiple AT commands to be associated with an event identified by an event identifier: *n*. Currently only two events are identified; event 0 indicates that the Five of Diamonds is currently operating using a land line base unitd communication line; event 1 indicates that the Five of Diamonds is currently operating using a cellular base unitd communications line. These events can change, and whenever a change is detected the Five of Diamonds will execute the AT commands associated with the event.

Multiple event base unitd commands can be on the same command line or can be entered on separate command lines. The AT command(s) associated with an event are stored in volatile memory, powering off the Five of Diamonds or executing the ATZ command will clear the command(s). A NULL *init string* will also serve as a way of clearing command(s) associated with an event.

All commands between the [*n* and then next], or [*n*, or the end of the command line will be associated with the event *n*. All commands will be verified and commands that require interaction or return information should not be used since these will be executed base unitd on changing events.

Examples

AT[0&F&C1&D2&S1W1S95=18]

The above command stores the &F&C1&D2&S1W1S95=18 commands for event 0 (land base unitd connection) and will be automatically executed when a change of event from cellular back to land base unitd is detected.

AT&F&C1&D2&S1[0S95=18][1S95=44)M1*H2:E0]

The above command processes the &F&C1&D2&S1 once when the command line is first entered, the S95=18 whenever operating as a land base unitd connection and S95=44)M1*H2:E0 whenever operating as a cellular base unitd connection.

AT[] or AT[0]

The above command clears any command(s) associated with event 0 (land base unitd connection).

Modem S Registers

The S registers are summarized below along with their default values. Registers denoted with an * may be stored in one of the two user profiles by entering the &Wn command. One of these profiles may be loaded at any time by using the Zn command.

Default Register Settings

The factory default values are stored in ROM and are loaded into the active configuration at power up or by the Zn command. In addition, the designated default profile is subsequently loaded, and may change some of the factory default values. The designated default profile can be changed by entering the &Yn command where n is one of the two possible user profiles. All of the factory default values may be loaded at any time by entering the &F command.

Modem Register Summary

Register	Title	Default
S0 *	Number of Rings Till Auto-Answer	0
S1	Ring Counter	0
S2 *	Escape Character	43
S3	Carriage Return Character	13
S4	Line Feed Character	10
S5	Back Space Character	8
S6	Wait For Blind Dialing *	2
S7 *	Wait For Carrier After Dial	50
S8 *	Pause Time For Dial Delay	2
S9 *	Carrier Detect Response Time	6
S10	Lost Carrier To Hang Up Delay	14
S11 *	DTMF Tone Duration	95
S12 *	Escape Code Guard Time	50
S13	Reserved	none
S14 *	Bit Mapped Options **	138
S15	Reserved	none
S16	Bit Mapped Test Options **	0
S17	Reserved	none
S18 *	Test Timer	0

Register	Title	Default
S19	Reserved	0
S20	Reserved	none
S21 *	Bit Mapped Options **	4
S22 *	Bit Mapped Options **	117
S23 *	Bit Mapped Options **	55
S24	Sleep Inactivity Timer	10
S25 *	Delay To DTR	5
S27 *	Bit Mapped Options **	74
S28	Bit Mapper Options	0
S29	Reserved	none
S30 *	Inactivity Timer	0
S31	Bit Mapper Options **	194
S32	XON Flow Control Character	17
S33	XOFF Flow Control Character	19
S34-S35	Reserved	none
S36 *	LAPM Failure Control	7
S37 *	Desired Telco Line Speed	0
S38 *	Delay Before Forced Disconnect	20
S39 *	Bit Mapped Options **	3
S40	Bit Mapped Options (MNP) **	105
S41	Bit Mapped Options (MNP) **	03
S44	Unused	none
S46 *	Protocol Selection	138
S48 *	V.42 Negotiated Action	7
S86	Connection Failure Cause Code	0
S95 *	Extended Result Codes	0

* Register value may be stored in one of two user profiles with the AT&Wn command.

** Writing to bit mapped options registers, although possible, can result in unreliable and unpredictable operation.

Register Descriptions

S0 — Number of Rings Till Auto-Answer

Range	0-255 rings
Default	0

Establishes the number of rings required before the Five of Diamonds answers incoming calls. Setting this register to zero disables auto-answer mode.

S1 — Ring Counter

Range	0-255 rings
Default	0

Number of rings which the Five of Diamonds detects before it answers a call. If no rings occur over an eight second interval, the register is cleared.

S2 — Escape Character

Range	0-255, ASCII decimal
Default	43

S2 holds the decimal value of the ASCII character used as the escape character. The default value corresponds to an ASCII '+'. A value over 127 disables the escape process, i.e., no escape character will be recognized.

S3 — Carriage Return Character

Range	0-127, ASCII decimal
Default	13 (Carriage Return)

Sets the command line and result code terminator character. Pertains to asynchronous operation only.

S4 — Line Feed Character

Range 0-127, ASCII decimal

Default 10 (Line Feed)

Sets the character recognized as a line feed. Pertains to asynchronous operation only. The Line Feed control character is output after the Carriage Return control character if verbose result codes are used.

S5 — Backspace Character

Range 0-32, ASCII decimal

Default 8 (Backspace)

Sets the character recognized as a backspace. Pertains to asynchronous operation only. The Five of Diamonds will not recognize the Backspace character if it is set to a value that is greater than 32 ASCII. This character can be used to edit a command line. When the echo command is enabled, the Five of Diamonds echoes back to the local communications software the backspace character, an ASCII space character, and a second backspace character; this means a total of three characters are transmitted each time the Five of Diamonds processes the backspace character.

S6 — Wait Time for Blind Dialing

Range	2-255 seconds
Default	2

Sets the length of time to pause after the Five of Diamonds goes off-hook and before the Five of Diamonds dials the first digit of the telephone number. The Five of Diamonds always pauses a minimum of 2 seconds even if the S6 register is set to a value less than 2 seconds. The "Wait for Dial Tone" call progress feature (W in the dial string) will override the value in register S6. If option X2 or X4 is in effect, this register is ignored.

S7 — Wait For Carrier After Dial

Range	1-255 seconds
Default	50

Defines two delay times:

1. During call establishment, this register establishes the time that the local Five of Diamonds waits for carrier from the remote modem before hanging up.
2. Sets the length of time that the Five of Diamonds waits when the "Wait For Dial Tone" call progress feature (W in the dial string) is in effect.

S8 — Pause Time For Dial Delay

Range 0-255 seconds

Default 2

Sets the length of time to pause when the Five of Diamonds encounters the "Pause During Dial" call progress feature, i.e., the comma (,).

S9 — Carrier Detect Response Time

Range 1-255 tenths of second

Default 6 (0.6 seconds)

Determines how long a carrier signal must be present before the Five of Diamonds recognizes it as a carrier and turns on /RLSD. As this time is increased, there is less opportunity to detect a false carrier due to noise from the telco line.

S10 — Lost Carrier To Hang Up Delay

Range 1-255 tenths of a second

Default 14 (1.4 seconds)

Sets the length of time the Five of Diamonds waits before hanging up after a loss of carrier. This allows for a temporary carrier loss without causing the local Five of Diamonds to disconnect. When register S10 is set to 255, the Five of Diamonds functions as if a carrier is always present.

The actual interval the Five of Diamonds waits before disconnecting is the value in register S10 minus the value in register S9. Therefore, the S10 value must be greater than the S9 value or the Five of Diamonds disconnects before it recognizes the carrier.

S11 — DTMF Tone Duration

Range 50-255 milliseconds

Default 95 milliseconds

Sets the duration of tones in Dual Tone Multifrequency (DTMF) dialing. This value has no effect on pulse dialing.

S12 — Escape Code Guard Time

Range 0-255 fiftieths of a second

Default 50 (1 second)

Sets the time delay required immediately before and after entering the escape code. The time interval between the sending of the first and second, or the second and the third escape code characters must be less than the value of the guard time.

S18 — Test Timer

Range 0-255 seconds

Default 0

Sets the length of time the Five of Diamonds conducts a test before returning to the command mode. If this register is zero, the test will not automatically terminate; the test must be terminated from the command mode by issuing an &T0 or H command.

S24 — Sleep Inactivity Timer

Range 0-255 seconds

Default 10 seconds

Sets the length of time, in seconds, that the Five of Diamonds will wait before entering power down sleep mode. The time is reset by any data activity or telephone line activity. A value of zero will disable power down sleep mode.

S25 — *Delay to DTR*

Range 0-255 (hundredths of a second)

Default 5

A change in /DTR (ON-to-OFF) that persists for a period less than the value held in S25 is ignored by the Five of Diamonds while in data mode.

S30 — *Inactivity Timer*

Range 0-255

Default 0 (disabled)

Determines the length of time, in units of ten-seconds, that the Five of Diamonds will wait before disconnecting when no data is sent or received. In MNP or V.42 mode, any data transmitted or received will reset the timer. In other modes, any data transmitted will reset the timer. The inactivity timer is inoperative in synchronous mode.

S32 — *XON Character*

Range 0-255

Default 17

Sets the value of the XON character.

S33 — *XOFF Character*

Range 0-255

Default 19

Sets the value of the XOFF character.

S36 — LAPM Failure Control

Range 0-7

Default 7

This register is used when the S48 register contains the value 128 and an attempted error correction link fails. Fallback options are initiated immediately upon connection if S48 = 128.

If an invalid number is entered, the number is accepted into the register, but S36 will act as if the default value is entered.

The S36 actions are:

S36 = 0	Five of Diamonds disconnects.
S36 = 1	Five of Diamonds stays on-line and a Direct mode connection is established.
S36 = 2	Reserved.
S36 = 3	Five of Diamonds stays on-line and a Normal mode connection is established.
S36 = 4	An MNP connection is attempted, and if it fails, the Five of Diamonds disconnects.
S36 = 5	An MNP connection is attempted, and if it fails, a direct mode connection is established.
S36 = 6	Reserved.
S36 = 7	An MNP connection is attempted, and if it fails, a Normal mode connection is established.

S37 — *Desired Telco Line Speed*

Range 0-12

Default 0

This register determines the desired telco line speed if the N0 command is in effect.

If an invalid number is entered, the number is accepted into the register, but S37 will act as if the default value is entered.

S37 = 0	Attempt automode connection.
S37 = 1-3	Attempt to connect at 300 bps.
S37 = 4	Reserved.
S37 = 5	Attempt to connect at V.22 1200 bps.
S37 = 6	Attempt to connect at V.22bis 2400 bps.
S37 = 7	Attempt to connect in V.23 75/1200 mode.
S37= 8	Attempt to connect at V.32bis/V.32 4800 bps.
S37=9	Attempt to connect at V.32bis/V.32 9600 bps.
S37=10	Attempt to connect at V.32bis 12000 bps.
S37=11	Attempt to connect at V.32bis 14400 bps.
S37=12	Attempt to connect at V.32bis 7200 bps.
S37=15	Attempt to connect at V.FC 14400 bps.
S37=16	Attempt to connect at 16800 bps *

S37=17	Attempt to connect at 19200 bps *
S37=18	Attempt to connect at 1600 bps *
S37=19	Attempt to connect at 24000 bps *
S37=20	Attempt to connect at 26400 bps *
S37=21	Attempt to connect at 28800 bps *

* Only applicable to TRUMPCARD 28800 version

S38 — Delay Before Forced Disconnect

Range	0-255 seconds
Default	20

This register specifies the delay between the Five of Diamonds' receipt of the Hangup (H) command to disconnect (or ON-to-OFF transition of /DTR if the Five of Diamonds is programmed to follow the signal) and the disconnect operation. For an error-correction connection, this register can be used to ensure that data in the Five of Diamonds' buffer is sent before the Five of Diamonds disconnects. If S38 is set between 0 and 254, the Five of Diamonds will wait that number of seconds for the remote modem to acknowledge all data in the Five of Diamonds buffer before disconnecting. If time expires before all data is sent, the NO CARRIER result code will be issued to indicate that data has been lost. If all data is transmitted prior to timeout, the response to the H0 command will be OK. If S38 is set to 255, the Five of Diamonds data does not timeout, and continues to attempt to deliver data in the buffer until the connection is lost, or the data is delivered.

S46 — Protocol Selection

Range 136 or 138

Default 136

Controls selection of compression.

The following actions are executed for the given values:

S46 = 136 Execute error correction protocol with no compression.

S46 = 138 Execute error correction protocol with compression. In addition to V.42bis, the Five of Diamonds also implements MNP4 data compression. V.42bis is used only with LAPM, and MNP5 only with MNP4.

S48 — V.42 Negotiation Action

Range 0, 7, or 128

Default 7

The V.42 negotiation process determines the capabilities of the remote modem. However, when the capabilities of the remote modem are known and negotiation is unnecessary, the process can be bypassed.

If an invalid number is entered, it is accepted into the S register, but S48 will act as if 128 is entered.

S48 = 0 Disable negotiation; bypass the detection and negotiation phases; and proceed with LAPM.

S48 = 7 Enable negotiation.

S48 = 128 Disable negotiation; bypass the detection and negotiation phases; and proceed at once with the fallback action specified in S36. Can be used to force MNP.

S86 — Connection Failure Cause Code

Range 0, 4, 5, 9, 12, 13, or 14
Default 0

When the Five of Diamonds issues a NO CARRIER result code, a value is written to this S register to help determine the reason for the failed connection. S86 records the first event that contributes to a NO CARRIER message.

The cause codes are:

S86 = 0	Normal disconnect, no error occurred.
S86 = 4	Loss of carrier.
S86 = 5	V.42 negotiation failed to detect an error-correction modem at the other end.
S86 = 9	The Five of Diamonds could not find a common protocol.
S86 = 12	Normal disconnect initiated by the remote modem.
S86 = 13	Remote modem does not respond after 10 re-transmissions of the same message.
S86 = 14	Protocol violation.

S95 — *Extended Result Codes*

The bits in this register can be set to override some of the Wn command options. A bit set to a 1 in this register will enable the corresponding result code regardless of the Wn setting.

Bit 0	CONNECT result code indicates DCE speed instead of DTE speed.
Bit 1	Append/ARQ to verbose CONNECT XXXX result code if protocol is not NONE.
Bit 2	Enable CARRIER XXXX result code.
Bit 3	Enable PROTOCOL XXXX result code.
Bit 4	Reserved.
Bit 5	Enable COMPRESSION result code.
Bit 6	Reserved.
Bit 7	Reserved.

Facsimile Commands

Facsimile commands are listed here only for reference. Use of these commands should be limited to facsimile application software.

If you have additional questions about the facsimile operation, please contact Ositech.

Class 1 Commands

Command	Description
+FTS=n	Stop transmission and wait
+FRS=n	Receive silence
+FTM=n	Transmit data
+FRM=n	Receive data
+FTH=n	Transmit data with HDLC framing
+FRH=n	Receive data with HDLC framing

Class 2 Commands

Action Commands

Command	Description
D	Originate a call
A	Answer a call
+FDT=	Data transmission
+FET=N	Transmit page punctuation
+FDR	Begin or continue phase C receive data
+FK	Session termination

DCE Responses

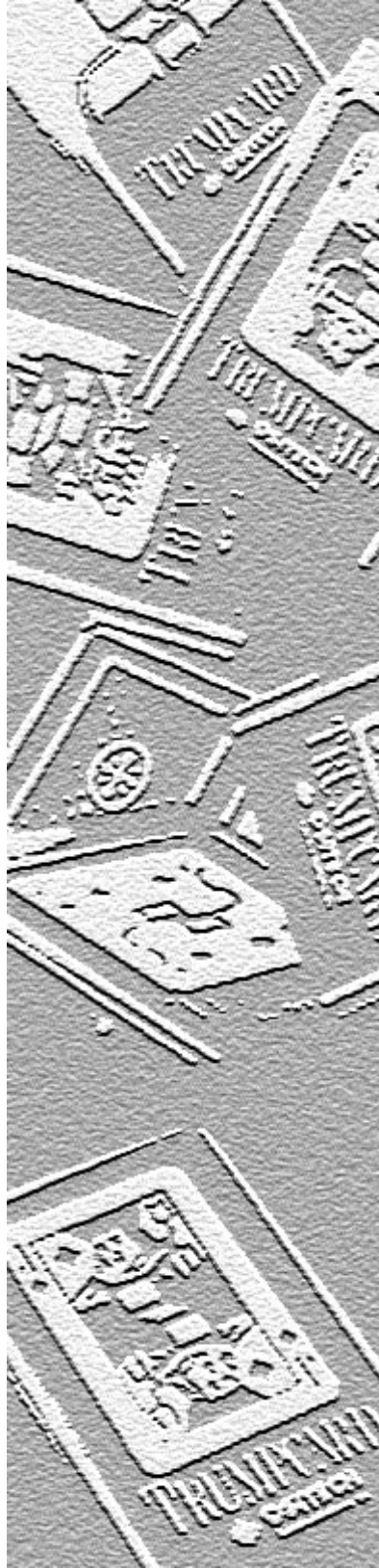
Command	Description
+FCON	Facsimile connection response
+FDCS:	Report current session
+FDIS:	Report remote identification
+FCFR	Indicate confirmation to receive
+FTSI:	Report the transmit station ID
+FCSI:	Report the called station ID
+FPTS:	Page transfer status
+FET:	Post page message response
+FHNG	Call termination with status

Session Parameters

Command	Description
+FMFR?	Identify manufacturer
+FMDL?	Identify model
+FREV?	Identify revision
+FDCC=	DCE capabilities parameters
+FDIS=	Current session parameters
+FDCS=	Current session results
+FLID=	Local ID string
+FCR	Capability to receive
+FPTS+	Page transfer status
+FCR=	Capability to receive
+FAA	Adaptive answer
+FBUF?	Buffer size (read only)
+FPHCTO	Phase C time out
+FPHXERR	Facsimile error value
+FBOR	Phase C data bit order

Section Six

Modem Test Procedures



This section describes the different tests you can perform when trying to determine the source of a problem. These tests include:

- Local Modem Self-Test.
- Local Analog Loopback.
- Local Analog Loopback with Self-Generated Pattern.
- Remote Digital Loopback.
- Remote Digital Loopback with Self-Generated Pattern.
- Local Digital Loopback.
- Testing Modem Memory.

Local Modem Self-Test

To run a local self-test:

- 1 Ensure the modem is in an interactive or local mode. Refer to your communications software documentation for more information.

Type `AT` and press *Enter*.

The modem responds with `OK`.

- 2 If you cannot see the characters you entered, the local modem echo is off. To turn on the local modem echo, type `ATE1` and press *Enter*.
- 3 If double characters appear on the screen, both the modem and software are set to local echo On. To set the modem to local echo off, type `ATE0` and press *Enter*.

If `0` appears on your screen instead of `OK`, the numeric form result codes have been enabled. To select textual result codes, type `ATV1` and press *Enter*. The modem responds with `OK`.

If the modem does not respond:

- Ensure that the communications software setup procedure was run after the modem was installed. Setup must be run each time the modem is installed.
- Check that the COM port address of the serial port is identical to the software COM port assignment.

Local Analog Loopback

This test checks the path between the local modem and the PC. This test only works when the modem is in direct mode (&Q0) and the COM port baud rate is set to 33600 bps or less.

Before running the local analog loopback test, ensure your modem is in command mode.

To run a local analog loopback test:

- 1 Type `AT&T1` and press *Enter*. Wait until the modem returns a **CONNECT** message.
- 2 *Enter* a test message. For example, type “This message should be echoed back.”

The message should immediately appear on the screen as you enter it.

- 3 Type `+++`.

This command is an escape sequence which returns the modem to command mode.

The modem will respond with **OK**. The modem is now in command mode.

- 4 Enter `AT&T0` and press *Enter* to end the test.

Local Analog Loopback with Self-Generated Pattern

This test verifies the integrity of the local modem transmit and receive circuits. The test works only when the modem is in direct mode (&Q0) and the COM port baud rate is set to 33600 bps or less.

For this test, the modem must be in command mode.

To start the test:

- 1 Type `AT&T8` and press *Enter*. Wait approximately ten seconds.

The modem will not respond visibly.

- 2 Enter `AT&T0` [*ENTER*] to mark the end of the test. The modem will respond with a three-digit number indicating the test results.

During this test, a continuous data sequence is sent by the local modem transmitter and picked up by the local modem receiver. The transmitted and received data sequences are compared and the modem then returns a three-digit number indicating test results. If the result is 000, the local modem transmit and receive circuits have passed the test.

Remote Digital Loopback

This test checks the local and remote modems and the telephone circuit. The test only works when the modem is set to direct mode (&Q0) and the COM port baud rate is set to 33600 bps or less.

The modem sends a message to the remote unit. The remote unit loops the test message back. The resulting message is then compared with the original message to verify the connection. If the data patterns do not match, then a problem exists with either the local or remote modem or the telephone circuit. If this is the case, both local and remote stations might initiate local analog loopback tests to further isolate the source of the problem.

To perform this test:

- 1 Type `AT&F&Q0` and press *Enter* to place the modem in basic asynchronous mode.
- 2 Establish a connection with a remote modem and enter `+++` (the escape sequence) to revert to command mode. The modem will reply with **OK**.
- 3 Type `AT&T6` and press *Enter* to begin the test. The modem will display a **CONNECT** response if the loopback data link has been successfully completed. It will display an **ERROR** response if the link has failed.

If successful, enter a test message. The message will be echoed on the local screen.

- 4 Type `+++` (the escape sequence). The modem will respond with **OK**.
- 5 Type `AT&T0` and press *Enter* to end the test. The modem will respond with **OK**.

Remote Digital Loopback with Self-Generated Pattern

This procedure tests the remote modem port, the telephone line and the local serial and modem ports. The test works only when the modem is in direct mode (&Q0) and the COM port baud rate is set to 33600 bps or less.

This test is similar to the Remote Digital Loopback test.

In this test, the local modem sends the remote modem a special test data sequence and the remote modem returns the data. The local modem examines the returned data and establishes an error count each time a mismatch is detected.

To run this test:

- 1 Establish a connection with a remote modem.
- 2 Type `AT&T4` and press *Enter* to ensure that the remote operator has set the modem to accept a Remote Digital Loopback request.
- 3 Type `AT&T7` and press *Enter* to initiate the remote digital loopback test. The modem will send a test pattern to the remote modem.
- 4 Type `AT&T0` and press *Enter* to end the test. The modem will return a three-digit number showing the test results. If the result is 000, the local and remote modems and the telephone line have passed the test.

Local Digital Loopback

This test is used to verify the communications link with the remote modem, and works only when the modem is in direct mode (&Q0) and the COM port baud rate is set to 33600 bps or less.

To run this test:

- 1 Establish a connection with a remote modem.
- 2 Type `AT&T3` and press *Enter* to place the modem into the local digital loopback mode.
- 3 Instruct the remote modem operator to enter a message.

During this test the local modem simply loops any incoming data back to the remote modem. If the information sent mirrors the image received by the remote modem, the test is successful.

- 4 Type `AT&T0` and press *Enter* to end the test.

Testing Modem Memory

The *I* command can be used to obtain information about the modem's memory and perform a checksum test.

Product Information

This test displays the modem's product information.

- Type `ATI3` and press *Enter*. The modem will respond with a line identifying the modem and its capabilities. Use this information when calling Ositech for technical support.

ROM Checksum Test

This test compares the ROM checksum result with a stored value.

- Type `ATI2` and press *Enter* to run this test. The modem will respond with the **OK** prompt if the totals match and an **ERROR** prompt if they differ. If the **ERROR** prompt appears, call Ositech technical support.

Glossary

Analog Line

Analog lines are the telephone lines commonly found in North American households. These lines allow a very simple phone, answering machine or fax machine to be connected. Devices that are designed for analog lines will not operate on the digital lines found in most businesses and hotels. In fact, these devices can be damaged if connected to these lines.

Digital Phone Interface (DPI)

Digital Phone Interface (DPI) is technology developed and patented by Ositech. Modems are analog and are unable to function with a digital phone system. Ositech's DPI enables TRUMPCARD modems to connect to a digital phone system through the telephone's analog handset cord. Using DPI technology, TRUMPCARD modems can operate in data and fax modes.

Digital Phone System

Digital phone systems are commonly found in businesses and hotels. These systems provide features not commonly available with analog phone systems, and are incompatible with analog equipment (e.g., modems). The higher current of digital lines can permanently damage modems that do not provide some form of digital line guard feature. Digital phone systems are also referred to as PBX systems.

DPI Assistant

Ositech's DPI Assistant is a Windows based application and serial port driver used to detect DPI connections and prompt the user to remove the handset from the cradle and dial manually.

DPI Wizard

Ositech's DPI Wizard is a Windows based application used to adjust modem settings for DPI connections. The DPI Wizard contains a database of predefined telephone systems and the optimal DPI settings for each of these systems.

PBX

PBX refers to the **P**riate **B**ranch **eX**change digital telephone equipment found in larger businesses. PBX allows a large number of phones within an office to share a smaller number of outside lines. PBX systems are also referred to as digital phone systems.

Section Eight

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